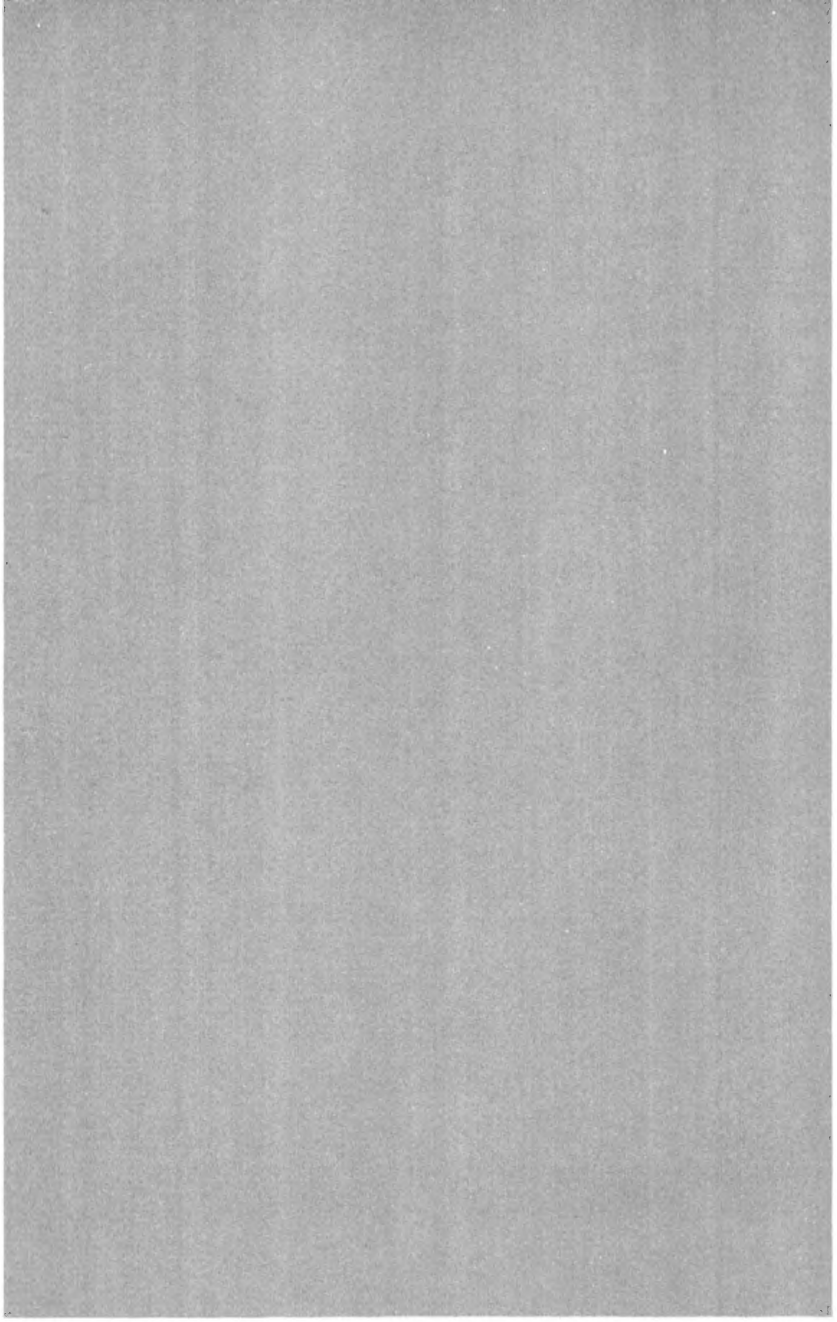
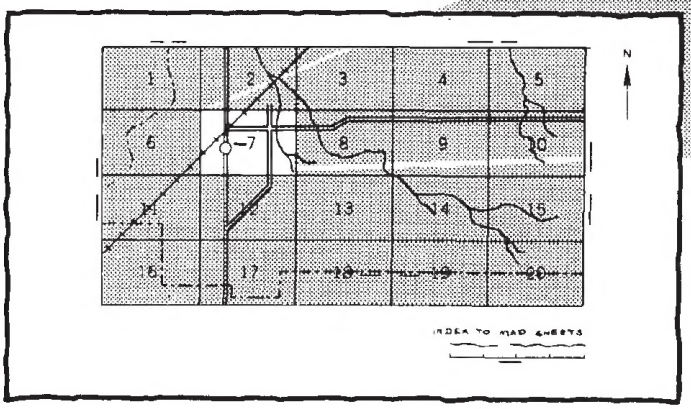


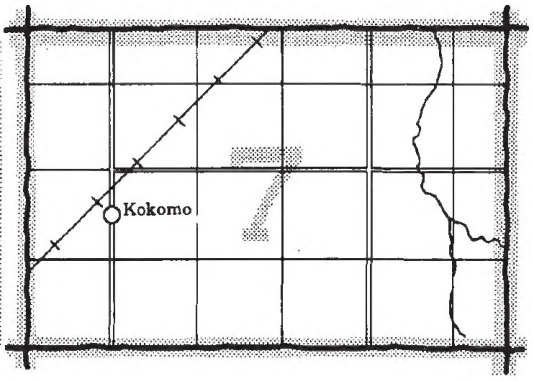
soil survey of Hanover County Virginia

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Virginia Polytechnic Institute and State University

HOW TO USE

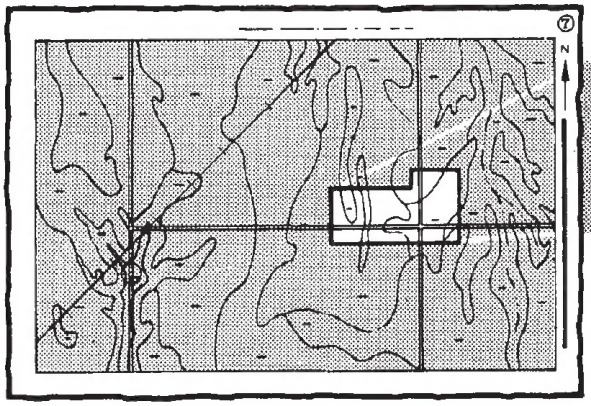
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

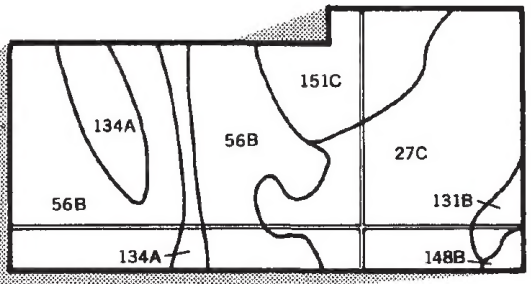




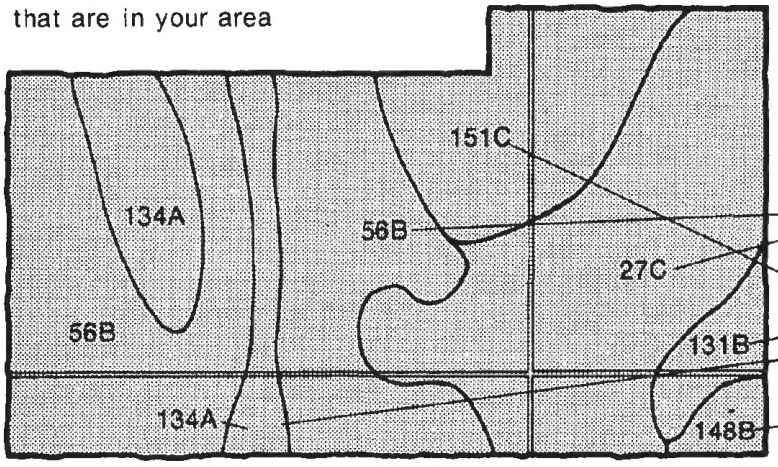
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.





4. List the map unit symbols that are in your area

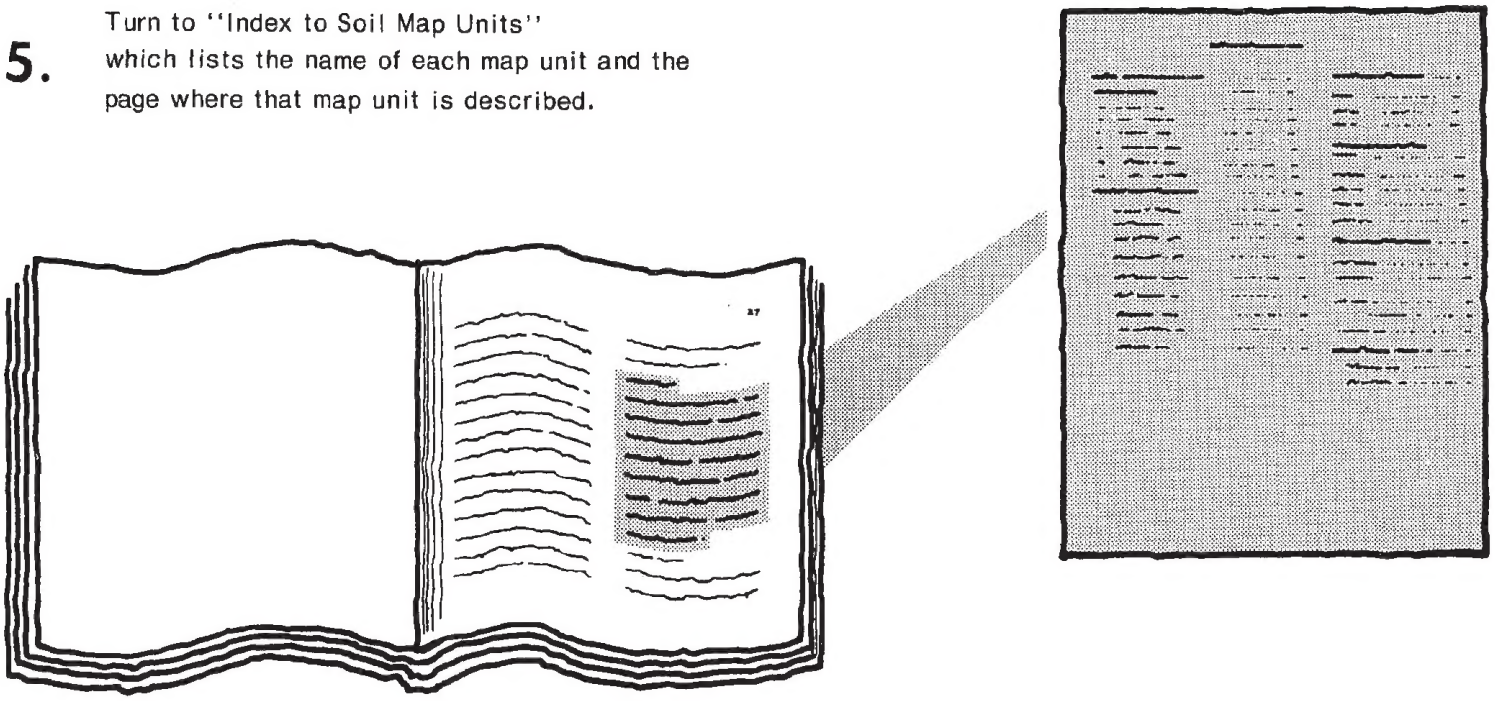


Symbols

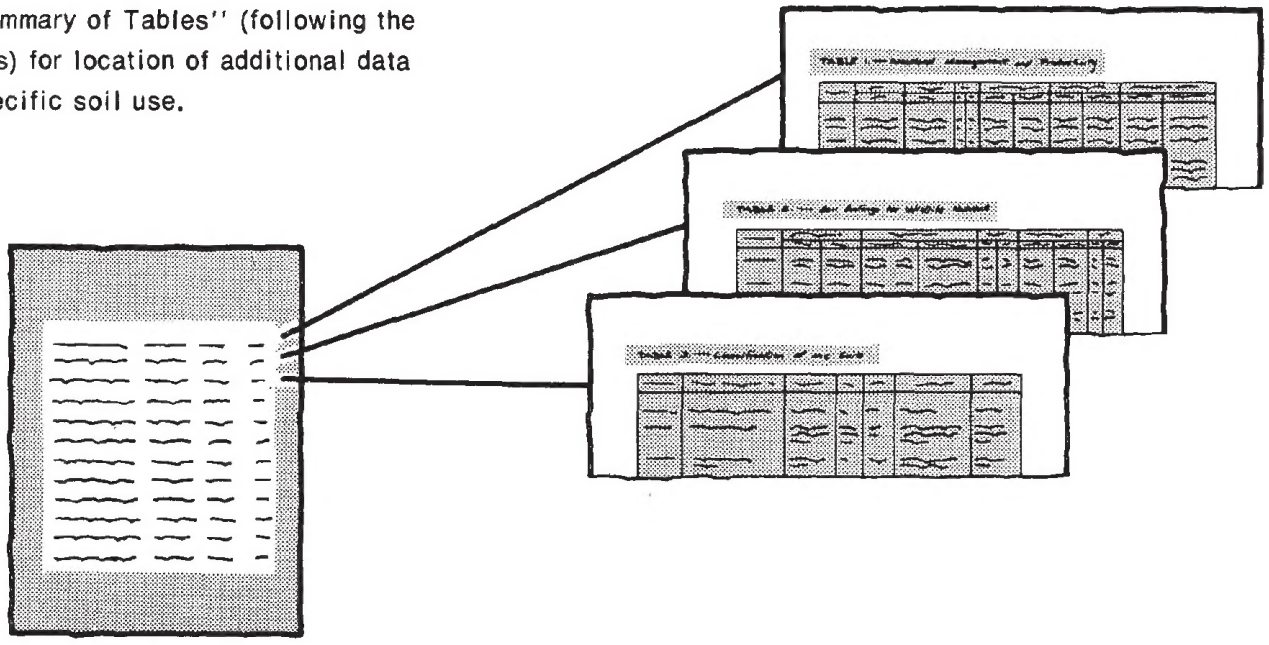
27C
56B
131B
134A
148B
151C

THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1967-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1975. This survey was made cooperatively by the Soil Conservation Service and the Virginia Polytechnic Institute and State University. It is part of the technical assistance furnished to the Hanover-Caroline Soil and Water Conservation District. This survey was financed in part by the Hanover County Board of Supervisors.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Contents

Contents—Continued

Issued March 1980

Index to map units

Summary of tables

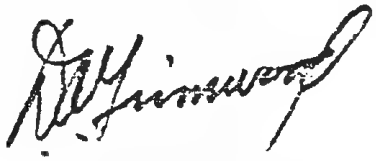
Foreword

This soil survey contains information that can be used in land-planning programs in Hanover County, Virginia. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

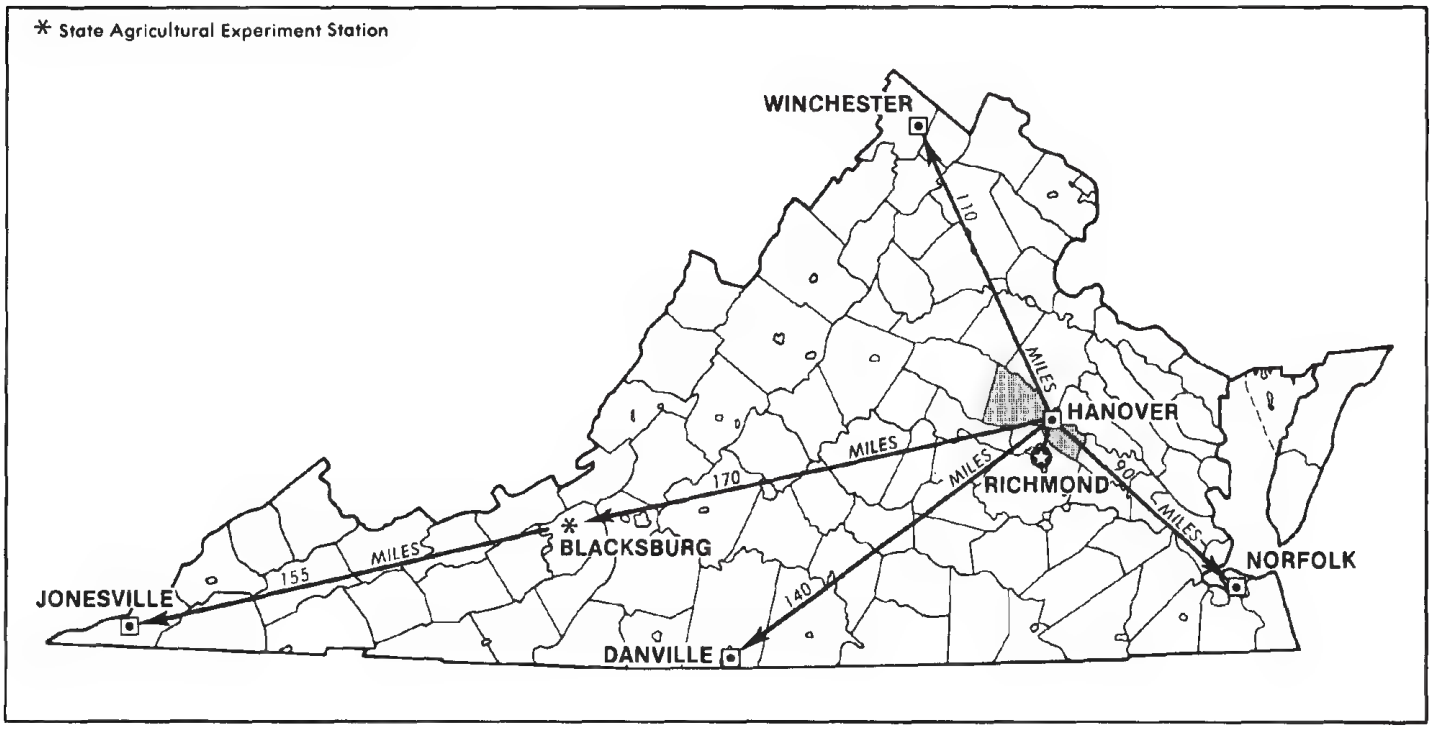
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.



David N. Grimwood
State Conservationist
Soil Conservation Service



Location of Hanover County in Virginia.

soil survey of

Hanover County Virginia

By Robert L. Hodges, Glenn Richardson, J. Paul Sutton, James E. Belshan, Thomas W. Simpson, W. Scott Barnes, and James E. Keys, Jr., Virginia Polytechnic Institute and State University

United States Department of Agriculture, Soil Conservation Service in cooperation with Virginia Polytechnic Institute and State University

HANOVER COUNTY is in east-central Virginia. It is bordered on the north by the North Anna River and the Pamunkey River; on the east by New Kent County; on the south by the Chickahominy River and Goochland County; and on the west by Louisa County. It has an area of about 471 square miles, or 301,440 acres. The Fall Line divides the survey area into an eastern part, on the Atlantic Coastal Plain, and a western part, on the Piedmont.

Urban development is replacing farming as the major land use. Most of the remaining farms produce small grains, corn, soybeans, hogs, and beef cattle. A few farms raise sheep, poultry, or dairy cattle.

About 68 percent of the survey area is wooded. Wood products are important to the economy of the county.

General nature of the survey area

This section gives general information about the county. It discusses history and development; climate; physiography, relief, and drainage; and water supply.

History and development

Settlement of the survey area started about 1650. Hanover County was formed from a part of New Kent County in 1720. It was named in honor of the Duke of Hanover, who later became King George I of England.

Many important events of the Revolution and the War Between the States occurred in Hanover County. Tourists are attracted by the many battlefields, homesteads, and other historic landmarks.

Hanover is the county seat. Ashland is the only incorporated town in the county.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Hanover County is hot in summer and rather cold in winter. Precipitation is well distributed throughout the year and is normally adequate for all crops. In winter, precipitation frequently occurs as snow, but the ground does not usually stay covered for more than a few days at a time.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Ashland, Virginia in the period 1951 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 37 degrees F, and the average daily minimum temperature is 26 degrees. The lowest temperature on record, which occurred at Ashland on January 18, 1957, is -7 degrees. In summer the average temperature is 74 degrees, and the average daily maximum temperature is 86 degrees. The highest recorded temperature, which occurred on September 8, 1954, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 41 inches. Of this, 22 inches, or about 52 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest

1-day rainfall during the period of record was 5.24 inches at Ashland on August 27, 1971. About 37 thunderstorms occur each year. Of these, 22 occur in summer.

Average seasonal snowfall is 11 inches. The greatest snow depth at any one time during the period of record was 16 inches. On an average of 2 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 50 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9 miles per hour, in March.

Physiography, relief, and drainage

Hanover County lies astride the Fall Line, which is approximately along the right-of-way of the Richmond, Fredericksburg, and Potomac Railroad. The Atlantic Coastal Plain is to the east of the Fall Line, and the Piedmont Plateau is to the west. This Fall Line is the limit of navigation on the major streams; rapids are upstream from the Fall Line and navigable tidal water is downstream. Elevation ranges from about sea level along the lower end of the Pamunkey River, in the eastern part of the survey area, to about 370 feet above sea level on the highest ridges near Mabelton, in the western part of the survey area.

Generally, the Coastal Plain is an area of gently rolling topography consisting of nearly level and gently sloping ridges and very steep side slopes along the smaller drainageways. There are some upland flats, and there are steep side slopes between the uplands and the flood plains of the Pamunkey River and the Chickahominy River and along the larger drainageways and streams. The soils on the Coastal Plain are commonly well drained or moderately well drained, but they range from excessively drained to poorly drained.

The Piedmont Plateau is an area of rolling topography consisting of gently sloping and sloping ridges and very steep slopes along drainageways. There are some upland flats, mainly along the eastern edge of the Piedmont, and some steep side slopes along the larger drainageways and streams. The soils on the Piedmont are commonly well drained or moderately well drained, but they range from well drained to poorly drained.

Long, narrow flood plains run along the North Anna River, the South Anna River, the Little River, the Pamunkey River, the Chickahominy River, and other large streams throughout the county. The soils on these flood plains are commonly well drained to very poorly drained.

The survey area is drained by the North Anna River, the South Anna River, the Little River, the Pamunkey River, and the Chickahominy River, and their tributaries. The drainage pattern is dendritic but rather irregularly branched and, on the upland flats, rather weakly expressed.

Water supply

There are many freshwater streams throughout the survey area. Generally, streamflow is adequate for most uses. There are, however, periods of drought during which streamflow is much reduced; therefore surface reservoirs are necessary to insure a dependable supply of water. The streams commonly carry a large load of sediment after heavy rains.

Large wells have been dug or drilled into the soil and weathered rock of the Piedmont and into the fluviomarine sediments of the Coastal Plain. These wells are commonly less than 60 feet deep. They yield small quantities of ground water that is moderately soft, sometimes slightly turbid, and often contaminated.

Smaller wells, about 6 inches in diameter, have been drilled to a depth of as much as 200 feet into the Piedmont and as much as 350 feet into the Coastal Plain. Some of these wells yield as much as 50 gallons per minute. Several wells in the Atlee-Old Cold Harbor area yield more than 100 gallons per minute. The largest reported yield, 280 gallons per minute, is from a well, near Poindexters, that is 200 feet deep.

The fluviomarine sediments of the coastal plain are the best potential source of large quantities of ground water. These sediments range from sand to clay and are commonly several hundred feet thick.

How this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds.

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteris-

tics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

General soil map for broad land use planning

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each association on the general soil map is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in other associations but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soils mainly on flood plains and terraces

The associations in this group are along the larger drainageways and streams throughout the survey area. The soils formed in alluvium that ranges from sand to clay. In some places the soils are gravelly. Most of the soils are nearly level to gently sloping. Some of the soils are periodically flooded or are waterlogged.

1. Fluvaquents-Chewacla-Altavista association

Deep, poorly drained, somewhat poorly drained, and moderately well drained soils that are frequently flooded and that have a mixed sandy, loamy, and clayey substratum or a loamy subsoil; along drainageways and streams

This association consists of nearly level soils on narrow to broad flood plains and low-lying terraces along the larger drainageways and streams. Many long, narrow flood plains and terraces are too small to show at the scale of mapping. The soils receive seepage and runoff from surrounding higher lying areas and are frequently flooded by nearby streams.

This association makes up about 3 percent of the survey area. It is about 32 percent Fluvaquents, 22 percent Chewacla soils, 14 percent Altavista soils, and 32 percent minor soils.

Fluvaquents and Chewacla soils are on the flood plains. Large areas are along the Pamunkey River, the Little River, and the South Anna River. Altavista soils are on the terraces. Fluvaquents are made up of mixed alluvium that ranges from sand to clay. They are flooded and ponded for long periods from December to May and after large storms throughout the rest of the year. In some areas, they are covered by standing water for 9 months or more. Chewacla soils are deep and somewhat poorly drained and have a loamy subsoil. Altavista soils are deep and moderately well drained and have a loamy subsoil.

Of minor extent in this association are Augusta, Dogue, Forestdale, Myatt Variant, and Wehadkee soils and Hydraquents and Udifluvents. Augusta, Dogue, Forestdale, and Myatt Variant soils are moderately well drained to poorly drained and are mainly on the terraces. Hydraquents are mainly in low-lying areas and are covered periodically by floodwaters or tidal waters. Udifluvents and Wehadkee soils are well drained to poorly drained and are on the flood plains.

Most of the acreage of this association is wooded. Farming is limited by flooding and wetness. In some small areas, the soils are used for small grains, soybeans, and pasture.

2. Pamunkey-Dogue-Forestdale association

Deep, well drained, moderately well drained, and poorly drained soils that have a dominantly loamy or clayey subsoil; on terraces and uplands

This association is mainly on broad, nearly level and gently sloping terraces. It is also in some low-lying areas on uplands. In most places on the higher lying terraces the soils are usually not flooded or wet; in small, slightly concave areas the soils are often wet, and in a few of these areas they are ponded for short periods. The soils on the lower lying terraces are often flooded. In most places, slopes are 0 to 7 percent. Along drainageways and small streams that are deeply incised and on terrace breaks, short, sharp slopes of 7 to 45 percent are common.

This association makes up about 8 percent of the survey area. It is about 24 percent Pamunkey soils, 16 percent Dogue soils, 8 percent Forestdale soils, and 52 percent minor soils.

The Pamunkey soils are on the terraces, mainly along the North Anna River and the Pamunkey River. The Dogue soils are in the low-lying areas on uplands, and the Forestdale soils are on the lower lying terraces and in the low-lying areas on uplands. These soils are mainly along the Chickahominy River.

Pamunkey soils are deep and well drained. Most of these soils have a loamy subsoil; some have a gravelly

loamy subsoil, and some have a clayey subsoil. Dogue soils are deep and moderately well drained and have a clayey subsoil. Forestdale soils are deep and poorly drained and have a clayey subsoil.

Of minor extent in this association are Altavista, Tarboro, Chewacla, Fork, Myatt Variant, Wahee, and Wehadkee soils and Fluvaquents, Hydraquents, and Udifluvents. Altavista, Fork, Myatt Variant, and Wahee soils are moderately well drained to poorly drained. They are in the slightly concave areas on the higher lying terraces, and they are on the low-lying terraces. Tarboro soils are excessively drained and are on the higher lying terraces close to the Pamunkey soils. Chewacla soils, Fluvaquents, Udifluvents, and Wehadkee soils are well drained to poorly drained and are on flood plains. Hydraquents are mainly in the low-lying areas along the Pamunkey River and are covered periodically by floodwater or tidal water.

Along the North Anna River and the Pamunkey River the soils are well suited to farming, and much of the acreage is cultivated. In some low-lying areas along these rivers the soils are frequently flooded, and most of the acreage is wooded. Along the Chickahominy River most of the acreage is wooded. A small acreage is used for cultivated crops, vegetables, and pasture. A few small industries have located on sites that are above the normal flood level.

Soils on the Coastal Plain

The associations in this group are mainly in the eastern half of the survey area. The soils formed in fluviomarine sediments that range from sand to clay. Some of the soils are gravelly. Most of the soils are on ridges and side slopes in an area of rolling topography; however, some are on upland flats, and some are in hilly areas along the larger, more deeply incised drainageways and streams.

3. Norfolk-Orangeburg-Faceville association

Deep, well drained soils that have a dominantly loamy or clayey subsoil; on uplands

This association is in an area of gently rolling and rolling topography that consists of broad ridges and side slopes. There are some small flats. On the ridges the slope is 0 to 7 percent. On most side slopes the slope is 7 to 15 percent. On side slopes along the larger drainageways and streams it is 15 to 45 percent; and on side slopes in some small areas along streams it is as much as 90 percent.

This association makes up about 14 percent of the survey area. It is about 29 percent Norfolk soils, 19 percent Orangeburg soils, 18 percent Faceville soils, and 34 percent minor soils.

Norfolk, Orangeburg, and Faceville soils are mainly on the ridges and gentler side slopes. In some areas, Orangeburg soils are intermingled with Faceville soils. Norfolk and Orangeburg soils have a loamy subsoil. Faceville soils have a clayey subsoil.

Of minor extent in this association are Atlee, Bourne, Dunbar, Duplin, Goldsboro, Kempsville, Kenansville, Suffolk, and Varina soils and Ochrepts and Udults. Atlee, Dunbar, and Duplin soils are moderately well drained and somewhat poorly drained and are on flats and ridges. Bourne, Kempsville, Kenansville, Suffolk, and Varina soils are moderately well drained and well drained and are on the ridges and the gentler side slopes. Goldsboro soils are moderately well drained and are in depressions, in low-lying areas, and at the head of drainageways. Ochrepts and Udults are excessively drained to moderately well drained and are on the steeper side slopes.

Much of the acreage of this association is wooded. Some acreage is used for a variety of cultivated crops and for dairy cattle and other livestock.

4. Duplin-Coxville-Dunbar association

Deep, moderately well drained, somewhat poorly drained, and poorly drained soils that have a dominantly clayey subsoil; on upland flats

This association is in an area of nearly level topography consisting of upland flats separated by broad, low ridges. Gentle side slopes are around the edges of the association. Slopes of 0 to 2 percent are dominant. On the ridges and side slopes the slope is 2 to 7 percent. A few narrow, steeper side slopes are along some of the larger drainageways and streams.

This association makes up about 4 percent of the survey area. It is about 27 percent Duplin soils, 22 percent Coxville soils, 17 percent Dunbar soils, and 34 percent minor soils.

Duplin, Coxville, and Dunbar soils are on the flats. Duplin soils are also on some of the ridges and gentle side slopes. Duplin soils are moderately well drained, Coxville soils are poorly drained, and Dunbar soils are somewhat poorly drained.

Of minor extent in this association are Atlee, Bourne, Dogue, Goldsboro, Lenoir, Norfolk, and Rains soils and Aquults, Ochrepts, and Udults. Aquults and Atlee, Goldsboro, Lenoir, and Rains soils are moderately well drained to poorly drained and are on flats and very gentle side slopes. Bourne, Dogue, and Norfolk soils are moderately well drained and well drained and are on flats, ridges, and gentle side slopes. Ochrepts and Udults are moderately well drained to excessively drained and are on the steeper side slopes.

Most of the acreage of this association is wooded; a large acreage is being urbanized.

5. Ochrepts-Udults-Kempsville association

Deep, well drained, somewhat excessively drained, excessively drained, and moderately well drained soils that have a dominantly sandy, loamy, or clayey subsoil or a loamy, somewhat brittle subsoil; on uplands

This association is in an area of hilly topography consisting of narrow and winding ridges, finger-shaped ridges, and side slopes. On the ridges the slope is 2 to 15 percent. On the side slopes it is 15 to 45 percent. On some side slopes along the larger streams the slope is 45 to 90 percent.

This association makes up about 3 percent of the survey area. It is about 34 percent Ochrepts, 31 percent Udults, 22 percent Kempsville soils, and 13 percent minor soils.

Ochrepts and Udults are on some of the ridges and on most of the steeper side slopes. These soils are intermingled. Kempsville soils are on ridges and on some of the gentler side slopes.

Ochrepts and Udults are excessively drained to moderately well drained; however, most of these soils are well drained or somewhat excessively drained. They have sandy, loamy, or clayey subsoil. Kempsville soils are well drained and have a loamy, somewhat brittle subsoil.

Of minor extent in this association are Bourne, Caroline, Faceville, Goldsboro, Kenansville, Orangeburg, and Suffolk soils. Bourne, Caroline, Faceville, Kenansville, Orangeburg, and Suffolk soils are moderately well drained and well drained and are on ridges and the gentler side slopes. Goldsboro soils are moderately well drained and are in small, nearly level and very gently sloping areas at the head of drainageways and in small depressions.

Most of the acreage of this association is wooded. In some small areas, the soils are used for a variety of farm products.

6. Udults-Ochrepts-Suffolk association

Deep, well drained, somewhat excessively drained, excessively drained, and moderately well drained soils that have a dominantly sandy, loamy, or clayey subsoil; on uplands

This soil association is in an area of rolling to hilly topography consisting of somewhat broad and broad ridges and side slopes. There are some small flats, commonly in areas of broad ridges and gentle side slopes. On the ridges the slope is 0 to 7 percent, and on the side slopes it is 7 to 45 percent. Along the larger drainageways and streams the ridges are narrow and winding or finger shaped. On these ridges the slope is 2 to 15 percent. On some side slopes along the larger streams the slope is 45 to 90 percent.

This association makes up about 17 percent of the survey area. It is about 32 percent Udults, 27 percent Ochrepts, 18 percent Suffolk soils, and 23 percent minor soils.

Udults and Ochrepts are mainly on narrow and winding ridges and finger-shaped ridges and on the steeper side slopes. Some Udults and the Ochrepts are intermingled. Suffolk soils are mainly on the somewhat broad and broad ridges and the gentler side slopes.

Udults and Ochrepts are excessively drained to moderately well drained; however, most of these soils are well drained or somewhat excessively drained. They have a sandy, loamy, or clayey subsoil. Some Udults and Ochrepts are gravelly throughout. Suffolk soils are well drained and have a loamy subsoil.

Of minor extent in this association are Atlee, Bourne, Caroline, Coxville, Dogue, Dunbar, Duplin, Faceville, Goldsboro, Kempsville, Kenansville, Masada, Norfolk, Orangeburg, and Varina soils. Atlee, Coxville, Dunbar, and Duplin soils are moderately well drained to poorly drained and are on the flats and broad ridges. Bourne, Caroline, Dogue, Faceville, Kempsville, Kenansville, Masada, Norfolk, Orangeburg, and Varina soils are moderately well drained to well drained and are on the somewhat broad to broad ridges and the gentler side slopes throughout most of the association. Goldsboro soils are moderately well drained and are at the head of drainageways, in depressions, in low-lying areas, and along the lower part of side slopes.

Much of the acreage of this association is used for a variety of farm products; however, in large areas, especially on the steeper side slopes, the soils are wooded. In large areas on the ridges the soils are cultivated or are in pasture. Some acreage is being developed, mostly for housing and small industries.

7. Norfolk-Caroline-Dogue association

Deep, well drained and moderately well drained soils that have a dominantly loamy or clayey subsoil; on uplands

This association is in an area of gently rolling and rolling topography consisting of broad ridges and side slopes. There are some small flats. On the ridges the slope is 0 to 7 percent, and on the side slopes it is 7 to 15 percent.

This association makes up about 2 percent of the survey area. It is about 33 percent Norfolk soils, 25 percent Caroline soils, 13 percent Dogue soils, and 29 percent minor soils.

Norfolk, Dogue, and Caroline soils are mainly on the ridges and side slopes. Norfolk soils are well drained and have a loamy subsoil. Caroline soils are well drained and have a clayey subsoil. Dogue soils are moderately well drained and have a clayey subsoil.

Of minor extent in this association are Bourne, Coxville, Dunbar, Duplin, Lenoir, Faceville, Kempsville, Orangeburg, and Suffolk soils. Bourne, Faceville, Kempsville, Orangeburg, and Suffolk soils are moderately well drained and well drained and are on the more pronounced ridges and on the gentler side slopes. Coxville, Dunbar, Duplin, and Lenoir soils are moderately well drained to poorly drained and are on the flats and some of the broad, low ridges near these flats.

Most of the acreage of this association is wooded. In small areas the soils are used for a variety of cultivated crops. Some acreage is used for urban development.

Soils on the Piedmont

The associations in this group are in the western half of the survey area. The soils formed in the residuum of weathered granite, gneiss, schist, sandstone, and shale. Some of the soils are gravelly. Most of the soils are on ridges and side slopes in an area of rolling topography; however, some are on upland flats, and some are in hilly areas along the larger, more deeply incised drainageways and streams.

8. Vance-Orange-Colfax association

Deep, well drained, moderately well drained, and somewhat poorly drained soils that have a dominantly very firm clayey subsoil or a fragipan; on uplands and upland flats

This association is in an area of upland flats with surrounding gently rolling topography consisting of broad ridges and side slopes. On the flats the slope is 0 to 2 percent. On the ridges the slope is 0 to 7 percent, and on the side slopes it is 2 to 15 percent. There are some broad flat areas along drainageways and streams, and in most of these areas the slope is 0 to 2 percent.

This association makes up about 10 percent of the survey area. It is about 31 percent Vance soils, 12 percent Orange soils, 11 percent Colfax soils, and 46 percent minor soils.

Vance and Colfax soils are on the ridges and side slopes. Orange soils are on the upland flats, in the flat areas along drainageways and streams, and on the ridges. They are commonly intermingled with the minor areas of Iredell soils. Vance soils are well drained and have a clayey subsoil. Orange soils are somewhat poorly drained to moderately well drained and have a clayey subsoil. Colfax soils are somewhat poorly drained to moderately well drained and have a fragipan.

Of minor extent in this association are Abell, Appling, Cecil, Fluvanna, Iredell, Spotsylvania, and Worsham soils and Aquults. Abell soils are moderately well drained to well drained and are at the head of drainageways in areas of gently rolling topography. Appling, Cecil, Fluvanna, and Spotsylvania soils are well drained and are on ridges and side slopes in areas of rolling topography. Aquults and Worsham soils are poorly drained and are on the upland flats and in the flat areas along drainageways and streams. Iredell soils are moderately well drained to somewhat poorly drained and are intermingled with Orange soils.

Much of the acreage of this association is wooded. Some acreage is used for a variety of cultivated crops and for livestock.

9. Creedmoor-Udalfs-Mayodan association

Moderately deep and deep, moderately well drained, well drained, somewhat excessively drained, and excessively drained soils that have a dominantly clayey or loamy subsoil; on uplands

This association is in an area of rolling to hilly topography consisting of narrow to somewhat broad, winding ridges and side slopes. On the ridges the slope is 2 to 15 percent, and on the side slopes it is 7 to 25 percent. Several large streams flow through this area, generally from west to east. On the side slopes along the streams the slope is as much as 45 percent and, in some small areas, as much as 90 percent. Narrow, nearly level flood plains and terraces are along the larger streams.

This association makes up about 5 percent of the survey area. It is about 21 percent Creedmoor soils, 21 percent Udalfs, 9 percent Mayodan soils, and 49 percent minor soils.

Creedmoor soils are on the ridges and the gentler side slopes. Some areas of Creedmoor soils are intermingled with areas of Mayodan soils and the minor areas of Pinkston soils. Udalfs are on finger-shaped ridges and gentler side slopes, where the topography is hilly, and on most of the steeper side slopes. Some areas of Udalfs are intermingled with minor areas of Ochrepts. Mayodan soils are on the ridges and side slopes. They are intermingled with Creedmoor and Pinkston soils.

Creedmoor soils are deep and moderately well drained and have a clayey subsoil. Udalfs are moderately deep and deep and well drained to excessively drained soils. They have a loamy or clayey subsoil. Mayodan soils are deep and well drained and have a clayey subsoil.

Of minor extent in this association are Bourne, Colfax, Edgehill Variant, Fluvanna, Masada, Norfolk, Pamunkey, Pinkston, Spotsylvania, Vance, and Worsham soils and Fluvaquents and Ochrepts. Bourne, Edgehill Variant, Fluvanna, Masada, Norfolk, Spotsylvania, and Vance soils are moderately well drained and well drained and are on the ridges and gentler side slopes. Colfax and Worsham soils are moderately well drained to poorly drained and are in depressions and along drainageways. Fluvaquents and Pamunkey soils are well drained to poorly drained and are on flood plains and terraces along the streams. Ochrepts are moderately well drained to excessively drained and are intermingled with Udalfs. Pinkston soils are well drained to excessively drained and are intermingled with Creedmoor and Mayodan soils.

Most of the acreage of this association is wooded. In small areas on the ridges and gentler side slopes and on the flood plains and terraces the soils are used for a variety of cultivated crops.

10. Cecil-Pacolet-Cullen association

Deep, well drained soils that have a dominantly clayey subsoil; on uplands

This association is in areas of rolling topography consisting of narrow to somewhat broad, winding ridges and side slopes. On most of the ridges the slope is 2 to 7 percent, and on most of the side slopes it is 7 to 15 percent. Near the larger drainageways and streams the slope is 2 to 15 percent on the ridges, which are narrower, and as much as 25 percent on the side slopes.

This association makes up about 14 percent of the survey area. It is about 25 percent Cecil soils, 11 percent Pacolet soils, 7 percent Cullen soils, and 57 percent minor soils.

Cecil, Pacolet, and Cullen soils are mainly on ridges and side slopes. They are deep and well drained and have a clayey subsoil. Some of the Cecil and Pacolet soils are gravelly.

Of minor extent in this association are Appling, Colfax, Georgeville, Edgehill Variant, Fluvanna, Spotsylvania, Vance, Wedowee, and Worsham soils and Fluvaquents and Aquults. Appling, Georgeville, Edgehill Variant, Fluvanna, Spotsylvania, Vance, and Wedowee soils are well drained and are on ridges and side slopes. Colfax soils and Aquults are moderately well drained to poorly drained and are in depressions, on small flats, and along drainageways. Fluvaquents and Worsham soils are poorly drained and are along the larger drainageways and streams.

Much of the acreage of this association is wooded; however, in large areas the soils are used for a variety of cultivated crops and for livestock.

11. Wedowee-Pacolet-Appling association

Deep, well drained soils that have a dominantly clayey and loamy subsoil; on uplands

This association is in an area of rolling topography consisting of narrow to somewhat broad, winding ridges and side slopes. On most of the ridges the slope is 2 to 7 percent, and on most of the side slopes it is 7 to 15 percent. Near the larger drainageways and streams the slope is 2 to 15 percent on the ridges, which are narrower, and as much as 25 percent on the side slopes.

This association makes up about 20 percent of the survey area. It is about 26 percent Wedowee soils, 12 percent Pacolet soils, 11 percent Appling soils, and 51 percent minor soils.

Wedowee, Pacolet, and Appling soils are mainly on the ridges and side slopes. Some of these soils are gravelly. Wedowee soils have a clayey and loamy subsoil, and Pacolet and Appling soils have a clayey subsoil.

Of minor extent in this association are Abell, Cecil, Colfax, Edgehill Variant, Fluvanna, Ashlar, Cullen, Vance, and Worsham soils and Fluvaquents and Aquults. Abell soils are moderately well drained to well drained and are at the head of drainageways and in depressions. Cecil, Edgehill Variant, Fluvanna, Cullen, and Vance soils are well drained and are on ridges and side slopes. Colfax soils and Aquults are moderately well drained to poorly drained and are on small upland flats and along drainageways. Fluvaquents and Worsham soils are poorly drained and are along the larger drainageways and streams. Ashlar soils are well drained to excessively drained and are on the steeper side slopes along drainageways and streams.

Most of the acreage of this association is wooded. In some small areas the soils are used for a variety of cultivated crops.

Soil maps for detailed planning

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil, a brief description of the soil profile, and a listing of the principal hazards and limitations to be considered in planning management.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Appling fine sandy loam, 2 to 7 percent slopes, is one of several phases in the Appling series.

A *soil complex* consists of two or more major soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Orange-Iredell complex, 2 to 7 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, borrow is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabili-

ties, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil descriptions

1B—Abell fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, moderately well drained to well drained soil in slightly concave, irregularly oval areas in upland depressions and at the head of drainageways on the Piedmont. Slopes are smooth and are about 140 to 150 feet long. Areas range from about 4 to 10 acres in size.

Typically, the surface layer is dark brown and brown fine sandy loam about 15 inches thick. The subsoil is about 24 inches thick. It is mostly yellowish brown and light olive brown, friable to firm, plastic sandy clay loam, clay loam, and clay and is mottled below a depth of about 27 inches. The substratum to a depth of about 60 inches is gray, yellowish red, and strong brown loam.

Included in mapping are small areas of well drained Appling, Cecil, Pacolet, Vance, and Wedowee soils; somewhat poorly drained Chewacla soils; somewhat poorly drained to moderately well drained Colfax soils; poorly drained Fluvaquents; moderately well drained Helena soils; somewhat excessively drained Pamunkey Variant soils; and poorly drained Worsham soils. The Appling, Cecil, Helena, Pacolet, Vance, and Wedowee soils are along the edges of the mapped areas. The Chewacla, Colfax, Pamunkey Variant, and Worsham soils and the Fluvaquents are mainly along drainageways. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic, and it has a low shrink-swell potential. The root zone extends to a depth of about 60 inches; but in many places, root growth is slightly limited below a depth of about 24 to 36 inches by the clayey subsoil. The surface layer and the subsoil are commonly very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, the bedrock does not generally limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed in some areas.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This soil is suited to trees, and some acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is high.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

2—Altavista fine sandy loam. This is a nearly level, moderately well drained soil on narrow to somewhat broad terraces along the larger streams on the Piedmont and the Coastal Plain. Most areas are elongated; some small areas are irregularly oval and slightly concave. Areas range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown and light yellowish brown fine sandy loam about 13 inches thick. The subsoil is yellowish brown, friable, slightly plastic sandy clay loam about 28 inches thick. It is mottled below a depth of about 27 inches. The substratum to a depth of about 90 inches is strong brown, yellowish brown, pale brown, and gray loamy sand.

Included in mapping are small areas of poorly drained Aquults and Fluvaquents; moderately well drained Bolling Variant soils; poorly drained Forestdale, Myatt Variant, and Worsham soils; somewhat poorly drained Fork and Wahee soils; moderately well drained to somewhat poorly drained Iredell and Orange soils; and well drained Pamunkey soils. The Aquults and Fluvaquents and the Forestdale, Myatt Variant, Worsham, Fork, and Wahee soils are in low-lying areas and along drainageways and streams. The Bolling Variant soils are scattered throughout the mapped areas. The Pamunkey soils are slightly higher on the landscape than this Altavista soil. The Iredell and Orange soils are along the edges of the mapped areas, next to the uplands. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, the bedrock does not generally limit the use of this soil. This soil is occasionally flooded for very brief periods in spring and early in summer.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. Much of the acreage of this soil is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage and flood control are needed. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

The soil is suited to trees, and some acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

3B—Appling fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

Typically, the surface layer is dark grayish brown and light olive brown fine sandy loam about 8 inches thick. The subsoil is about 44 inches thick. It is mostly strong brown, friable to firm, plastic clay loam and clay and is mottled below a depth of about 33 inches. The substratum to a depth of about 60 inches is mottled, strong brown, yellowish red, red, and white loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; somewhat poorly drained to moderately well drained Colfax soils; poorly drained Fluvaquents; well drained Norfolk, Spotsylvania, Vance, and Varina soils; and poorly drained Worsham soils. Abell soils are in small saddles and along small drainageways. Bourne, Helena, Norfolk, Spotsylvania, and Vance soils are mainly on the crest of the broader ridges. Colfax soils are on small flats and in slightly concave areas. Fluvaquents and Worsham soils are mainly along drainageways. Vance soils are on the narrower ridges. The included soils make up 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but the natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. About one-third of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses because of the moderate permeability and moderate shrink-swell potential. The moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

3C2—Appling fine sandy loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and side slopes. Slopes are smooth, commonly complex, and about 120 to 500 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

Typically, the surface layer is dark grayish brown and light olive brown fine sandy loam about 5 inches thick. The subsoil is about 44 inches thick. It is mostly strong brown, friable to firm, plastic clay loam and clay and is mottled below a depth of about 30 inches. The substratum to a depth of about 60 inches is mottled, strong brown, yellowish red, red, and white loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, well drained to excessively drained Ashlar soils, moderately well drained

Bourne soils, poorly drained Fluvaquents, well drained Vance and Varina soils, and poorly drained Worsham soils. The Abell and Worsham soils and the Fluvaquents are along drainageways. The Bourne, Vance, and Varina soils are mainly on the upper part of side slopes. The Ashlar soils are mainly on points of ridges and on the lower part of side slopes. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. It is limited for use as septic tank absorption fields because of the moderate permeability and slope. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

4B—Appling gravelly sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow, convex ridgetops. Slopes are smooth and about 80 to 300 feet long. Areas are long and narrow. They range from 4 to 10 acres in size.

Typically, the surface layer is dark grayish brown and light olive brown gravelly sandy loam about 8 inches thick. The subsoil is about 44 inches thick. It is mostly strong brown, friable to firm, plastic clay loam and clay and is mottled below a depth of about 33 inches. The substratum to a depth of about 60 inches is mottled, strong brown, yellowish red, and white loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, moderately well drained Bourne soils, and well drained Edgehill Variant and Spotsylvania soils. The Abell soils are in saddles and along small drainageways. The Bourne, Edgehill Variant, and Spotsylvania soils are along the crest of ridges. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. The soil is low in natural fertility and in content of organic matter. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore the bedrock generally does not limit the use of the soil.

This soil is well suited to cultivated crops and to pasture and hay. About one-fourth of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and damage farm equipment.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability and the moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIs.

4C—Appling gravelly sandy loam, 7 to 15 percent slopes. This is a sloping, well drained soil on narrow, convex ridgetops and side slopes. Slopes are smooth, commonly complex, and about 150 to 350 feet long.

Areas are long and narrow. They range from 4 to 10 acres in size.

Typically, the surface layer is dark grayish brown and light yellowish brown gravelly sandy loam about 8 inches thick. The subsoil is about 44 inches thick. It is mostly strong brown, friable to firm, plastic clay loam and clay and is mottled below a depth of about 33 inches. The substratum to a depth of about 60 inches is mottled, strong brown, yellowish red, red, and white loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, moderately well drained Bourne soils, poorly drained Fluvaquents, and well drained Edgehill Variant and Spotsylvania soils. The Abell soils and the Fluvaquents are along drainageways. The Bourne, Edgehill Variant, and Spotsylvania soils are along the side slopes. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. The soil is low in natural fertility and in content of organic matter. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of the soil.

This soil is well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and damage farm equipment.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. The moderate permeability and slope are also limitations to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIs.

5C—Appling-Ashlar complex, 5 to 15 percent slopes. This complex consists of sloping, well drained to somewhat excessively drained soils. These soils are on narrow, convex ridgetops; on the upper part of narrow, convex side slopes; and along small drainageways on narrow, convex side slopes. Slopes are smooth and complex and about 80 to 250 feet long. Areas are commonly long and winding. They range from 4 to 40 acres in size.

This complex is about 35 percent Appling fine sandy loam and about 30 percent Ashlar sandy loam. Included soils make up the rest. The Appling soil is on ridges and side slopes. The Ashlar soil is mainly on the points of ridges and on the lower part of side slopes.

Typically, the surface layer of the Appling soil is dark grayish brown and light olive brown fine sandy loam about 8 inches thick. The subsoil is about 44 inches thick. It is mostly strong brown, friable to firm, plastic clay loam and clay and is mottled below a depth of about 33 inches. The substratum to a depth of about 60 inches is mottled, strong brown, yellowish red, red, and white loam. The surface layer of the Ashlar soil is dark grayish brown and brown sandy loam about 11 inches thick. The subsoil is brown, friable gravelly sandy loam about 12 inches thick. The substratum is yellowish brown, friable gravelly loam, and it extends to a depth of 30 inches. It is underlain by bedrock.

Included in mapping are small areas of well drained Edgehill Variant and Vance soils and rock outcrop. The Edgehill Variant soils are mainly on the crest of ridges and the upper part of side slopes. The Vance soils are mainly on ridgetops. The rock outcrop is on the points of ridges and on side slopes.

Permeability is moderate in the Appling soil and rapid in the Ashlar soil. The available water capacity is moderate in the Appling soil and low in the Ashlar soil. Runoff is medium to rapid. Erosion is a severe to very severe hazard. Tilth is fair. The soils are low in natural fertility and in content of organic matter. In the Appling soil, the subsoil is plastic and has a moderate shrink-swell potential. In this soil, the root zone extends to a depth of about 60 inches. In the Ashlar soil, the subsoil is slightly plastic and has a low shrink-swell potential. In this soil, the root zone extends to bedrock, which is at a depth of 24 to 40 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied.

The soils in this complex are poorly suited to cultivated crops. They are better suited to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. The Ashlar soil is droughty during the growing season.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to

reduce the acidity of the soils, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and the droughtiness of the Ashlar soil are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soils can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

The Appling soil is limited for urban uses because of the moderate permeability, moderate shrink-swell potential, and slope. The Ashlar soil is limited for these uses because of the moderate depth to bedrock and slope. The Appling and Ashlar soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IVe.

6—Aquults, nearly level. These are poorly drained soils on broad upland flats and in low-lying areas at the head of and along drainageways on the Piedmont. Areas are irregularly rectangular or irregularly oval. They are commonly 180 to more than 1,000 feet wide and 5 to more than 50 acres in size.

In general, the surface layer is gray fine sandy loam about 10 inches thick. The subsoil to a depth of about 30 inches is mostly gray or light gray clay but ranges to sandy loam. Below that, to a depth of about 60 inches or more, it is a fragipan consisting of gray or light gray, brittle and compact sandy loam to sandy clay loam.

Included in mapping are small areas of somewhat poorly drained to moderately well drained Colfax soils, poorly drained Coxville soils, moderately well drained Helena soils, and poorly drained Worsham soils. The Colfax, Coxville, and Worsham soils are commonly along small drainageways. The Helena soils are commonly around the outside edges of the mapped areas, next to the uplands. Also included are small areas of these Aquults that are ponded or are underlain by sandstone at a depth of about 30 or more inches. The included soils make up about 10 to 15 percent of this map unit.

Permeability is slow to very slow, and the available water capacity is low. Runoff is slow. Tilth is poor, and the soils are commonly wet, even waterlogged, in winter and spring. The subsoil material above the fragipan is commonly plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 30 inches. Root growth is severely limited by the fragipan, which is commonly at a depth of 24 to 36 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied.

These soils are not suited to cultivated crops or to hay. They are poorly suited to pasture because they are wet in winter and spring and are often droughty in summer and fall.

These soils are suited to trees, and most of the acreage is wooded. The trees are mainly pine, for which the hazard of seedling mortality is severe. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is severely limited by wetness in winter and spring and during other prolonged wet periods.

These soils are limited for urban uses because of wetness and the slow to very slow permeability. They are a poor source of subgrade material for local roads and streets.

This map unit is not assigned to a capability subclass.

7—Atlee loam, 0 to 4 percent slopes. This is a nearly level to very gently sloping, moderately well drained soil on broad ridges and in low lying areas on the Coastal Plain. Areas of this soil are irregularly rectangular or irregularly oval, commonly slightly convex or slightly concave, and about 200 feet to about 1,000 feet wide. They range from 5 to 40 acres in size.

Typically, the surface layer is grayish brown loam about 9 inches thick. The subsoil to a depth of about 27 inches is mostly light olive brown and yellowish brown, friable to firm, slightly plastic loam and clay loam that has gray mottles below a depth of about 22 inches. A firm, brittle and compact layer is at a depth of about 27 inches, and it extends to a depth of about 80 inches.

Included in mapping are small areas of moderately well drained Bourne soils, poorly drained Coxville soils, somewhat poorly drained Dunbar soils, and well drained Faceville, Norfolk, and Orangeburg soils. The Bourne soils are scattered throughout the mapped areas. The Coxville and Dunbar soils are along small drainageways and in slightly concave areas. The Faceville, Norfolk, and Orangeburg soils are slightly higher on the landscape than the Atlee soil throughout the mapped areas. The included soils make up about 10 to 15 percent of the map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by the brittle and compact layer, which is at a depth of about 24 to 36 inches. The surface layer and the subsoil are commonly very strongly acid or strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. Much of the acreage of this soil is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can

help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and some of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses and for use as septic tank absorption fields because of its moderately slow permeability and a seasonal high water table. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

8—Augusta fine sandy loam. This is a nearly level, somewhat poorly drained soil. It is on narrow to somewhat broad, low-lying terraces along the larger streams on the Piedmont and the Coastal Plain. Most areas are elongated; some small areas are irregularly oval and slightly concave. The areas range from 5 to 20 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 7 inches thick. The subsoil is about 43 inches thick. It is mostly light olive gray, friable, slightly plastic clay loam and sandy loam and is commonly mottled. The substratum to a depth of about 76 inches is olive, pale olive, and yellowish brown loamy sand.

Included in mapping are small areas of moderately well drained Altavista, Bourne, Duplin, Goldsboro, and Kenansville Variant soils; poorly drained Coxville, Myatt Variant, and Rains soils; poorly drained Fluvaquents; and well drained Kempsville soils. The Altavista, Bourne, Duplin, Goldsboro, Kenansville Variant, and Kempsville soils are slightly higher on the landscape than the Augusta soil throughout the mapped areas. The Coxville, Myatt Variant, and Rains soils are in slight depressions and along drainageways and streams. The Fluvaquents are on the lower lying positions along drainageways and streams. The included soils make up about 15 to 20 percent of the map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 50 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil. This soil is occasionally flooded for brief periods in spring and early in summer (fig. 1).

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a large acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

9—Bolling Variant gravelly sandy loam. This is a nearly level, moderately well drained soil. It is on narrow to broad, slightly concave terraces along the larger streams on the Piedmont and the Coastal Plain. Areas are commonly elongated or irregularly oval and 200 to more than 1,000 feet wide. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is very dark grayish brown gravelly sandy loam about 11 inches thick. The subsoil is about 24 inches thick. It is mostly dark yellowish brown gravelly sandy loam in the upper part and very gravelly sandy loam in the lower part. The substratum to a depth of about 64 inches is layered pale brown sand and gravel and grayish brown gravelly sandy clay loam.

Included in mapping are small areas of moderately well drained Altavista soils and somewhat poorly drained Augusta soils. The Altavista soils are scattered throughout the mapped areas. The Augusta soils are in slight depressions and in low areas along drainageways and streams. Also included are areas of soils that have a surface layer of loamy sand. The included soils make up about 15 percent of this map unit.

Permeability is moderately rapid. The available water capacity is low. Runoff is slow. Erosion is a slight hazard. Tilth is fair, but there are enough pebbles in the surface

Figure 1.—This area of Augusta fine sandy loam and Altavista fine sandy loam is subject to flooding in spring and early in summer.

layer to dull and damage plowshares. Natural fertility is moderate, and the content of organic matter is high. The subsoil is slightly plastic in the upper part and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly medium acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage of this soil is farmed. This soil is droughty during the growing season. Maintaining the content of organic matter, reducing acidity, and improving fertility are management concerns.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, but only a small acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is high.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table. Ground water pollution is a hazard if this soil is used as septic tank absorption fields. This soil is a good source of fill for local roads and streets because it has a high content of gravel.

This map unit is in capability subclass IIIs.

10B—Bourne fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, moderately well drained soil on broad convex ridgetops on the Coastal Plain and the eastern edge of the Piedmont. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are elongated, irregularly rectangular, or irregularly oval. They range from 5 to 20 acres in size.

Typically, the surface layer is grayish brown and light yellowish brown fine sandy loam about 13 inches thick.

The subsoil in the upper part is yellowish brown, friable, slightly plastic sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan is light yellowish brown and gray, brittle and compact, nonplastic sandy loam. The substratum is white, very firm and very plastic clay.

Included in mapped areas on the Piedmont are moderately well drained to well drained Abell soils; moderately well drained Creedmoor soils; well drained Mayodan, Norfolk, Varina, and Spotsylvania soils; and somewhat poorly drained to moderately well drained Colfax soils. The included soils are scattered throughout the mapped areas. Included in mapped areas of this soil on the Coastal Plain are moderately well drained Atlee, Dogue, Duplin, and Goldsboro soils; somewhat poorly drained Augusta and Dunbar soils; well drained Caroline, Kempsville, Norfolk, Pamunkey, and Suffolk soils; and poorly drained Coxville soils. The Atlee, Dogue, and Duplin soils are scattered throughout the mapped areas. The Goldsboro, Augusta, Coxville, and Dunbar soils are in slight depressions or along small drainageways and streams. The Caroline, Kempsville, Norfolk, and Suffolk soils are slightly higher on the landscape than the Bourne soil. The Pamunkey soils are along streams. The included soils make up about 15 to 20 percent of this map unit.

Permeability is slow to very slow, and the available water capacity is low. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 24 inches. Root growth is severely limited by the fragipan, which is commonly at a depth of 18 to 34 inches. The surface layer and the subsoil are commonly very strongly acid to extremely acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Alfalfa is short-lived because of seasonal wetness and the shallowness of the root zone. This soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This soil is suited to trees, and some acreage is wooded. The trees are mainly pine, for which the hazard of windthrow is moderate. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and the slow to very slow permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

10C—Bourne fine sandy loam, 7 to 15 percent slopes. This is a sloping, moderately well drained soil on slightly convex side slopes on the Coastal Plain and on the eastern edge of the Piedmont. Slopes are smooth, commonly complex, and about 120 to 350 feet long. Areas are elongated. They range from 4 to 10 acres in size.

Typically, the surface layer is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil in the upper part is yellowish brown, friable, slightly plastic sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan is light yellowish brown and gray, brittle and compact, nonplastic sandy loam. The substratum is white, very firm and very plastic clay.

Included in mapped areas on the Piedmont are moderately well drained to well drained Abell soils, poorly drained Fluvaquents, and well drained Spotsylvania and Varina soils. The Abell, Spotsylvania, and Varina soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways and streams. Included in mapped areas on the Coastal Plain are somewhat poorly drained Dunbar soils; poorly drained Fluvaquents; and well drained Kempsville, Norfolk, and Suffolk soils. The Dunbar soils are in slightly concave areas. The Fluvaquents are along drainageways and streams. The Kempsville, Norfolk, and Suffolk soils are scattered throughout these mapped areas. The included soils make up about 15 to 20 percent of the map unit.

Permeability is slow and very slow, and the available water capacity is low. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 24 inches. Root growth is severely limited by the fragipan, which is commonly at a depth of 18 to 34 inches. The surface layer and the subsoil are commonly very strongly acid to extremely acid unless lime has been applied. This soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay.

Alfalfa is short-lived because of seasonal wetness and the shallowness of the root zone. This soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This soil is suited to trees, and some acreage is wooded. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and slow and very slow permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

11B—Bourne-Varina complex, 2 to 7 percent slopes. This complex consists of gently sloping, moderately well drained and well drained soils on broad, convex ridgetops along the western edge of the Coastal Plain. Slopes are smooth and about 80 to 400 feet wide. Areas are elongated, irregularly rectangular, or irregularly oval. They range from 5 to 30 acres in size.

This complex is about 40 percent moderately well drained Bourne fine sandy loam and about 35 percent well drained Varina gravelly sandy loam. Included soils make up the rest.

Typically, the surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 13 inches thick. The subsoil in the upper part is yellowish brown sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan consists of brittle, compact, light yellowish brown and gray sandy loam. The substratum is white clay. The surface layer of the Varina soil is dark grayish brown and light olive brown gravelly sandy loam about 7 inches thick. The subsoil is about 58 inches thick. It is mostly strong brown clay loam that is mottled below a depth of about 32 inches.

Included in mapping are small areas of well drained Appling, Faceville, Mayodan, Norfolk, Orangeburg, Spotsylvania, and Vance soils; moderately well drained Creedmoor soils; and somewhat poorly drained to moderately well drained Colfax soils. The Appling, Faceville, Mayodan, Norfolk, Orangeburg, Spotsylvania, and Vance soils are scattered throughout the mapped areas. The Creedmoor and Colfax soils are on small flats and along small drainageways.

Permeability is moderate to very slow, and the available water capacity is low to moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but in some places there are enough pebbles in the surface layer to dull and damage plowshares. The content of organic matter and natural fertility are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are strongly acid to extremely acid unless limed. These soils are deep to bedrock; therefore the bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture. They are also moderately well suited to hay; however, alfalfa is often short-lived because of seasonal wetness and a shallow root zone. The soils are droughty during the growing season. Erosion is a management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderate to moderately high. The windthrow hazard is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

The soils in this complex are limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and the moderate to very slow permeability. They are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

11C—Bourne-Varina complex, 7 to 15 percent slopes. This complex consists of sloping, moderately well drained and well drained soils. These soils are on slightly convex side slopes along the western edge of

the coastal plain. Slopes are smooth, commonly complex, and about 160 to 400 feet long. Areas are small and elongated. They range from 4 to 20 acres in size.

This complex is about 40 percent moderately well drained Bourne fine sandy loam and 35 percent well drained Varina gravelly sandy loam. Included soils make up the rest.

Typically, the surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil in the upper part is yellowish brown sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan consists of brittle, compact, light yellowish brown and gray sandy loam. The substratum is white clay. The surface layer of the Varina soil is dark grayish brown and light olive brown gravelly sandy loam about 7 inches thick. The subsoil is about 58 inches thick. It is mostly strong brown clay loam that is mottled below a depth of 32 inches.

Included in mapping are small areas of well drained Appling, Pacolet, and Wedowee soils; moderately well drained Helena soils; somewhat poorly drained to moderately well drained Colfax soils; poorly drained Worsham soils; and poorly drained Fluvaquents. The Appling, Pacolet, and Wedowee soils are scattered throughout the mapped areas. The Helena and Colfax soils are around the head of drainageways. The Fluvaquents are along drainageways and streams.

Permeability is very slow to moderate. The available water capacity is low to moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but in some places there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil has a low shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are strongly acid to extremely acid unless lime is applied. These soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are poorly suited to cultivated crops. They are better suited to close-growing crops and to pasture and hay. Alfalfa is short-lived because of seasonal wetness and severely restricted root growth. These soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees. The trees are mainly pine, for which the hazard of windthrow is moderate. The potential productivity is moderate to moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

The soils in this complex are limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and the moderate to very slow permeability. They are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

12B—Caroline fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are long and winding. They range from 4 to 20 acres in size.

Typically, the surface layer is grayish brown and yellowish brown fine sandy loam about 8 inches thick. The subsoil is about 70 inches thick. It is mostly yellowish red, firm, plastic clay that is strongly mottled below a depth of about 34 inches.

Included in mapping are small areas of moderately well drained Atlee, Bourne, Dogue, Duplin, and Goldsboro soils and well drained Kempsville, Norfolk, and Suffolk soils. The Atlee, Dogue, Duplin, and Goldsboro soils are on small flats and along small drainageways. The Bourne, Kempsville, Norfolk, and Suffolk soils are scattered throughout the mapped areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited below a depth of about 34 inches by the firm subsoil. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Erosion is a major management problem (fig. 2). The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the

Figure 2.—In the eroded spot in this area of Caroline fine sandy loam, 2 to 7 percent slopes, tilth is poor, and the crop is failing.

acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderately slow permeability and moderate shrink-swell potential. The moderately slow permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

12D2—Caroline fine sandy loam, 15 to 25 percent slopes, eroded. This is a moderately steep, well drained soil that is commonly on narrow, convex side slopes that are between the uplands and the terraces and flood plains on the Coastal Plain. Slopes are smooth and complex and about 120 to 450 feet long. Areas are commonly long and winding. They range in size from 5 acres to more than 40 acres.

Typically, the surface layer is grayish brown and yellowish brown fine sandy loam about 5 inches thick. The subsoil is about 65 inches thick. It is mostly yellowish red, firm, plastic clay that is strongly mottled below a depth of about 29 inches.

Included in mapping are small areas of well drained Faceville soils, poorly drained Fluvaquents, soils that have a gravelly surface layer, and soils that have a surface layer of clay and clay loam. The Faceville soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways and small streams. The included soils make up about 20 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches; however, root growth is somewhat restricted to a depth of

about 29 inches by the firm subsoil. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of the soil.

This soil is not suited to cultivated crops. It is moderately well suited to pasture and some hay crops. It is somewhat droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. The trees are mainly pine. The potential productivity is moderately high. The use of the equipment generally needed in woodland management or harvesting is limited by slope. The hazard of erosion as a result of logging operations is severe.

This soil is limited for many urban uses and for use as septic tank absorption fields because of the moderately slow permeability and slope. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass VIe.

13B2—Caroline-Dogue complex, 2 to 7 percent slopes, eroded. This complex consists of gently sloping, well drained and moderately well drained soils on broad, convex ridgetops on the Coastal Plain. Slopes are smooth, commonly complex, and about 80 to 600 feet long. Areas are elongated, irregularly rectangular, or irregularly oval. They range from 5 to 30 acres in size.

This complex is about 40 percent well drained Caroline fine sandy loam and 25 percent moderately well drained Dogue loam. Included soils make up the rest.

Typically, the surface layer of the Caroline soil is grayish brown and yellowish brown fine sandy loam about 5 inches thick. The subsoil is about 65 inches thick. It is mostly yellowish red clay that is strongly mottled below a depth of about 29 inches. The surface layer of the Dogue soil is dark grayish brown loam about 5 inches thick. The subsoil is about 35 inches thick. It is mostly strong brown and yellowish brown clay. The substratum to a depth of about 99 inches is strong brown, yellowish brown, brown, red, and gray sandy clay loam and sandy loam.

Included in mapping are small areas of moderately well drained Atlee, Duplin, and Goldsboro soils and well drained Faceville, Norfolk, and Suffolk soils. The Atlee and Duplin soils are on small flats and along small drainageways. The Goldsboro soils are mainly along the edges of the mapped areas. The Faceville, Norfolk, and Suffolk soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of sandy clay loam and clay loam.

Permeability is moderately slow and moderate. The available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair to good, but the natural fertility and the content of organic matter are low. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, the bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is moderately high to high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

These soils are limited for many urban uses because of the moderately slow permeability and moderate shrink-swell potential and a seasonal high water table. The moderate and moderately slow permeability and a seasonal high water table are limitations to the use of these soils as septic tank absorption fields. These soils are a poor to fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

13C2—Caroline-Dogue complex, 7 to 15 percent slopes, eroded. This complex consists of sloping, well drained and moderately well drained soils on narrow, convex ridgetops and on narrow to broad, slightly convex side slopes. Slopes are smooth, commonly complex, and about 80 to 900 feet long. Areas are elongated, irregularly rectangular, or irregularly oval. They range in size from 5 acres to more than 50 acres.

This complex is about 35 percent well drained Caroline fine sandy loam and 30 percent moderately well drained Dogue loam. Included soils make up the rest.

Typically, the surface layer of the Caroline soil is grayish brown and yellowish brown fine sandy loam about 5 inches thick. The subsoil is about 65 inches thick. It is mostly yellowish red clay that is strongly mottled below a depth of about 29 inches. The surface layer of the Dogue soil is dark grayish brown loam about 5 inches thick. The subsoil is about 35 inches thick. It is mostly strong brown and yellowish brown clay. The substratum to a depth of about 99 inches is strong brown, yellowish brown, brown, red, and gray sandy clay loam and sandy loam.

Included in mapping are small areas of moderately well drained Bourne and Goldsboro soils; poorly drained Fluvaquents; and well drained Faceville, Norfolk, Orangeburg, and Suffolk soils. The Bourne and Goldsboro soils are mostly on the upper part of the side slopes. The Fluvaquents are along drainageways. The Faceville, Norfolk, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of sandy clay loam and clay loam.

Permeability is moderately slow to moderate. The available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair to good, but natural fertility and the content of organic matter are low. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless limed. In most places, these soils are quite deep to bedrock; therefore, the bedrock does not generally limit the use of these soils.

These soils are well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high to high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

The soils in this complex are limited for many urban uses because of the moderately slow permeability, the moderate shrink-swell potential, a seasonal high water table, and slope. The moderately slow permeability and seasonal high water table are also limitations to the use of these soils as septic tank absorption fields. These soils are a poor to fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

14B2—Cecil fine sandy loam, 2 to 7 percent slopes, eroded. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

Typically, the surface layer is yellowish brown and brown fine sandy loam about 5 inches thick. The subsoil is about 48 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 60 inches is red clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne soils; well drained Faceville, Fluvanna, Kenansville, Orangeburg, Spotsylvania, Vance, and Varina soils; and moderately well drained to somewhat poorly drained Iredell and Orange soils. The Abell soils are along small drainageways. The Bourne, Iredell, and Orange soils are on the broader ridges. The Faceville, Fluvanna, Kenansville, Orangeburg, Spotsylvania, Vance, and Varina soils are scattered throughout the mapped areas. Also included, in spots, are soils that are gravelly and soils that are severely eroded and have a surface layer of yellowish red loam or clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. About one-fourth of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability and moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

14C2—Cecil fine sandy loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 50 acres.

Typically, the surface layer is yellowish brown and brown fine sandy loam about 5 inches thick. The subsoil is about 48 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 60 inches is red clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne soils; well drained Fluvanna, Spotsylvania, Vance, and Varina soils; moderately well drained to somewhat poorly drained Iredell and Orange soils; poorly drained soils mapped as Fluvaquents; and poorly drained Worsham soils. The Abell soils are along small drainageways. The Bourne, Fluvanna, Spotsylvania, Vance, and Varina soils are scattered throughout the mapped areas. The Iredell and Orange soils are at the head of drainageways. The Fluvaquents and Worsham soils are along drainageways. Also included, in spots on ridges and the upper part of side slopes, are soils that are gravelly and soils that are severely eroded and have a surface layer of yellowish red loam or clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. The moderate permeability and slope are limitations to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

15B2—Cecil-Vance gravelly sandy loams, 2 to 7 percent slopes, eroded. This complex consists of gently sloping, well drained soils on narrow to somewhat broad, convex ridgetops. Slopes are smooth and complex and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

This complex is about 35 percent Cecil soil and about 30 percent Vance soil. Included soils make up the rest.

Typically, the surface layer of the Cecil soil is yellowish brown and brown gravelly sandy loam about 5 inches thick. The subsoil, about 48 inches thick, is mostly red clay. The substratum to a depth of about 60 inches is red clay loam. The surface layer of the Vance soil is yellowish brown gravelly sandy loam about 5 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown clay and is strongly mottled below a depth of about 27 inches. The substratum to a depth of about 65 inches is yellowish red clay loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils and well drained Faceville, Fluvanna, Spotsylvania, Varina, and Wedowee soils. The Abell soils are along small drainageways and in slightly concave areas. The Faceville, Fluvanna, Spotsylvania, and Wedowee soils are scattered throughout the mapped areas. The Varina soils are mainly on the crest of ridges. Also included, in spots, are soils that are severely eroded and have a surface of gravelly sandy clay loam or gravelly clay loam.

Permeability is moderate to slow. The available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is slightly limited in places by a very firm subsoil. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless limed. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

These soils are well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and can damage farm equipment.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees. Most of the trees are pine. The potential productivity is moderately high.

The soils in this complex are limited for many urban uses and for use as septic tank absorption fields because of the moderate to slow permeability and moderate shrink-swell potential. They are a fair to poor source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

15C2—Cecil-Vance gravelly sandy loams, 7 to 15 percent slopes, eroded. This complex consists of sloping, well drained soils. These soils are on narrow, convex ridgetops; narrow, convex upper side slopes; and narrow, convex side slopes along small drainageways. Slopes are smooth and complex and about 120 to 250 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

This complex is about 35 percent Cecil soil and 30 percent Vance soil. Included soils make up the rest.

Typically, the surface layer of the Cecil soil is yellowish brown and brown gravelly sandy loam about 5 inches thick. The subsoil, about 48 inches thick, is mostly red clay. The substratum to a depth of about 60 inches is red clay loam. The surface layer of the Vance soil is yellowish brown gravelly sandy loam about 5 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown clay and is strongly mottled below a depth of about 27 inches. The substratum to a depth of about 65 inches is yellowish brown, strong brown, light gray, and yellowish red clay loam.

Included in mapping are small areas of moderately well drained Bourne soils and well drained Fluvanna, Spotsylvania, and Varina soils. These soils are scattered throughout the mapped areas. Also included, in spots on the crests of narrow ridges and on the upper side slopes, are soils that are severely eroded and have a surface layer of yellowish red, yellowish brown, or brown gravelly sandy clay loam or gravelly clay loam.

Permeability is moderate to slow. The available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is slightly limited in some places by a very firm subsoil. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless limed. In most places, these soils are deep to bedrock; therefore, the bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and damage farm equipment.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

These soils are limited for many urban uses and for use as septic tank absorption fields because of the moderate to slow permeability, moderate shrink-swell potential, and slope. They are a fair to poor source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

15D2—Cecil-Vance gravelly sandy loams, 15 to 25 percent slopes, eroded. This complex consists of mod-

erately steep, well drained soils on narrow, convex side slopes along drainageways. Slopes are smooth and complex and about 120 to 200 feet long. Areas are commonly long and winding. They range from 4 to 20 acres in size.

This complex is about 40 percent Cecil soil and 35 percent Vance soil. Included soils make up the rest.

Typically, the surface layer of the Cecil soil is yellowish brown and brown gravelly sandy loam about 5 inches thick. The subsoil, about 48 inches thick, is mostly red, firm, plastic clay. The substratum to a depth of about 60 inches is red clay loam. The surface layer of the Vance soil is yellowish brown gravelly sandy loam about 5 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown, very firm, very plastic clay and is strongly mottled below a depth of about 27 inches. The substratum to a depth of about 65 inches is yellowish brown, strong brown, light gray, and yellowish red clay loam.

Included in mapping are small areas of poorly drained Fluvaquents, well drained to excessively drained Ashlar soils, and well drained Varina soils. The Fluvaquents are along drainageways. The Ashlar soils are mainly on the lower part of side slopes, and the Varina soils are mainly on the upper part of side slopes. Also included, in spots, are soils that are severely eroded and have a surface layer of yellowish red or brown sandy clay loam or gravelly clay loam.

Permeability is moderate in the Cecil soil and slow in the Vance soil. The available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil of the Cecil soil is plastic, and the subsoil of the Vance soil is very plastic. Shrink-swell potential is moderate. The root zone extends to a depth of about 60 inches, but root growth is slightly limited in the Vance soil by the very firm subsoil. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are poorly suited to cultivated crops. They are better suited to close-growing crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere with tillage and planting and damage farm equipment.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for urban uses and for use as septic tank absorption fields by slope. They are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass IVe.

16—Chewacla fine sandy loam. This is a nearly level, somewhat poorly drained soil on narrow to broad flood plains along streams and large drainageways on the Piedmont and the Coastal Plain. Areas are commonly elongated. They range from 5 to about 30 acres in size.

Typically, the surface layer is dark grayish brown fine sandy loam about 9 inches thick. The subsoil is about 33 inches thick. It is mostly brown, friable, slightly plastic loam in the upper part and gray, friable, slightly plastic sandy loam in the lower part. It has gray mottles in the upper part. The substratum to a depth of about 60 inches is gray sandy loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils, moderately well drained Altavista and Bolling Variant soils, somewhat poorly drained Augusta soils, poorly drained Fluvaquents, and poorly drained Wehadkee soils. The Abell, Altavista, and Bolling Variant soils are in the higher areas next to uplands or terraces. The Augusta soils are in low areas next to uplands and terraces. The Fluvaquents and Wehadkee soils are in low areas along drainageways and streams. Also included, in spots, are sandy soils and gravelly soils. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility is low and the content of organic matter is moderate. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly medium acid to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, the bedrock generally does not limit the use of this soil. This soil is frequently flooded for brief periods in spring and early in summer.

This soil is well suited to cultivated crops if it is drained and if flooding is controlled, and it is well suited to pasture. It is also well suited to hay; however, alfalfa

is short-lived because of seasonal wetness. The moderate content of organic matter, the acidity, and the low natural fertility are management problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. Artificial drainage and flood control are needed. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a large acreage is wooded. The woodland consists of pine and hardwoods. The potential productivity is very high. Seedling mortality is a moderate hazard. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness and flooding.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVw.

17B—Colfax fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, somewhat poorly drained to moderately well drained soil in small, slightly concave areas at the head of drainageways; in shallow depressions; in small, low-lying saddles; and on small, slightly concave toe slopes on the Piedmont. Slopes are smooth, commonly complex, and about 100 to 400 feet long. Areas are small and irregularly rectangular, irregularly oval, or elongated. They are 5 to about 15 acres in size.

Typically, the surface layer is dark grayish brown and light yellowish brown fine sandy loam about 8 inches thick. The subsoil to a depth of about 24 inches is mostly light olive brown, friable, slightly plastic sandy clay loam. Below that, to a depth of about 60 inches, it is a fragipan consisting of gray and light gray, brittle and compact, slightly plastic fine sandy loam and sandy loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Cecil, Spotsylvania, and Vance soils; moderately well drained Helena soils; somewhat poorly drained to moderately well drained Orange soils; poorly drained Worsham soils; and poorly drained Fluvaquents. The Abell soils are mainly in saddles and on the upper part of toe slopes. The Appling, Cecil, Spotsylvania, and Vance soils are along the edges of the mapped areas. The Helena and Orange soils are scattered throughout the mapped areas. The Worsham soils are on the lower part of toe slopes and along small drainageways. The Fluvaquents are along drainageways. These included soils make up 15 to 20 percent of this map unit. Also included, in spots, are gravelly soils. They make up about 5 percent of this map unit.

Permeability is slow, and the available water capacity is low. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 24 inches. Root growth is severely limited by the fragipan, which is commonly at a depth of 18 to 34 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Alfalfa is short-lived because of seasonal wetness and the shallowness of the root zone. The soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This soil is suited to trees and much of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

17C—Colfax fine sandy loam, 7 to 15 percent slopes. This is a sloping, somewhat poorly drained to moderately well drained soil in small, shallow depressions at the head of drainageways and on small toe slopes. Slopes are smooth, commonly complex, and

about 120 to 350 feet long. Areas are elongated or irregularly oval. They are 4 to 10 acres in size.

Typically, the surface layer is dark grayish brown and light yellowish brown fine sandy loam about 8 inches thick. The subsoil to a depth of about 24 inches is mostly light olive brown, friable, slightly plastic sandy clay loam. Below that, to a depth of about 60 inches, it is a fragipan consisting of gray and light gray, brittle and compact, slightly plastic fine sandy loam and sandy loam.

Included in mapping are small areas of well drained Appling soils, poorly drained Fluvaquents, moderately well drained Helena soils, somewhat poorly drained to moderately well drained Orange soils, and poorly drained Worsham soils. The Appling, Helena, and Orange soils are along the edges of the mapped areas, next to the uplands. The Fluvaquents and the Worsham soils are along small drainageways. Also included, in spots, are soils that are gravelly and soils that do not have a subsoil above the fragipan. The included soils make up about 15 percent of this map unit.

Permeability is slow, and the available water capacity is low. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 24 inches. Root growth is severely limited by the fragipan, which is commonly at a depth of 18 to 34 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. Alfalfa is short-lived because of seasonal wetness and the shallowness of the root zone. The soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high. The use of equipment generally used in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

18—Coxville loam. This is a nearly level, poorly drained soil on broad upland flats on the Coastal Plain. Areas are irregularly rectangular or irregularly oval, commonly slightly concave, and about 200 feet to 1,000 feet wide. They range in size from 5 acres to more than 60 acres.

Typically, the surface layer is dark gray and gray loam about 12 inches thick. The subsoil to a depth of about 82 inches is mostly gray, firm, plastic clay that is commonly mottled with brighter colors.

Included in mapping are small areas of moderately well drained Atlee and Duplin soils, somewhat poorly drained Dunbar and Lenoir soils, well drained Orangeburg and Faceville soils, poorly drained Rains soils, and poorly drained Fluvaquents. The Atlee, Duplin, Faceville, and Orangeburg soils are mainly around the edges of the mapped areas. The Dunbar, Lenoir, and Rains soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways. Also included, in spots, are very poorly drained soils and ponded soils. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is fair, but the soil is wet during the spring. Natural fertility is low and the content of organic matter is moderate. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by wetness below a depth of about 40 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is moderately well suited to pasture and hay. Alfalfa is short-lived because of seasonal wetness. Acidity and low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and

low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is severe. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is severely limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVw.

19B—Creedmoor fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, moderately well drained soil on narrow to somewhat broad, convex ridgetops and the upper part of side slopes. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are elongated or long and winding. They range from 4 to about 20 acres in size.

Typically, the surface layer is very dark gray and light yellowish brown fine sandy loam about 11 inches thick. The subsoil is about 28 inches thick. It is mostly very firm, very plastic clay that is yellowish brown in the upper part and gray in the lower part. The substratum extends to a depth of about 88 inches. It is gray sandy clay in the upper part and gray and brown sandy loam in the lower part.

Included in mapping are small areas of moderately well drained Bourne soils; somewhat poorly drained to moderately well drained Colfax soils; well drained Edgehill Variant, Mayodan, Norfolk, and Pamunkey soils; well drained to excessively drained Pinkston soils; and poorly drained Worsham soils. The Colfax, Pamunkey, and Worsham soils are mainly along small drainageways. The Bourne, Edgehill Variant, Mayodan, Norfolk, and Pinkston soils are mainly on narrow ridges and the upper part of side slopes. Also included, in spots, are soils that have a surface layer of gravelly fine sandy loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is very slow, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is very plastic and has high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by the very firm clay at a depth of about 21 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of its very slow permeability and high shrink-swell potential. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

20B—Creedmoor Variant fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, somewhat poorly drained soil on slightly concave slopes in small depressions, along drainageways, and on toe slopes. Slopes are smooth and about 80 to 300 feet long. Areas are irregularly oval or elongated. They are 5 to 20 acres in size.

Typically, the surface layer is dark gray and pale brown fine sandy loam about 10 inches thick. The subsoil is about 45 inches thick. It is mostly gray, very firm, very plastic clay. The substratum to a depth of about 92 inches is gray clay.

Included in mapping are small areas of somewhat poorly drained to moderately well drained Colfax soils, moderately well drained Duplin soils, well drained Mayodan and Suffolk soils, and poorly drained Worsham soils. The Colfax soils are scattered throughout the mapped areas. The Duplin, Mayodan, and Suffolk soils are around the edges of the mapped areas. The Worsham soils are mainly along drainageways and near the center of concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is very slow, and the available water capacity is moderate. Runoff is medium. Erosion is a slight hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is very plastic and has high shrink-swell potential. The root zone extends to

a depth of about 60 inches, but root growth is somewhat limited by the very firm clay at a depth of about 16 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of its very slow permeability and high shrink-swell potential and a seasonal high water table. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

21B2—Cullen loam, 2 to 7 percent slopes, eroded. This is a gently sloping, well drained soil on somewhat broad, convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are elongated or long and winding. They are 4 to 20 acres in size.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil is about 50 inches thick. It is mostly red and dark red firm, plastic clay. The substratum to a depth of about 120 inches is dark red and white, weathered hornblende gneiss that crushes to loam.

Included in mapping are small areas of moderately well drained to well drained Abell soil; somewhat poorly drained to moderately well drained Colfax soil; moderately well drained Helena soil; well drained Pacolet, Vance, and Wedowee soils; and poorly drained Worsham soils. The Abell, Colfax, and Helena soils are mainly along small drainageways and on small flats. The Pacolet, Vance, and Wedowee soils are scattered throughout the mapped areas. The Worsham soils are at the head of drainageways and along drainageways. Also included, in spots on the crest of ridges, are severely eroded soils that have a clay loam surface layer. The included soils make up 15 to 20 percent of this map unit.

Permeability of this soil is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. About one-half of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and about one-half of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability and moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

21C2—Cullen loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly elongated. They range in size from 5 to 10 acres.

Typically, the surface layer is reddish brown loam about 8 inches thick. The subsoil is about 45 inches thick. It is mostly red and dark red, firm, plastic clay. The

substratum to a depth of about 60 inches is dark red, red, yellowish red, pinkish white, and black, weathered hornblende gneiss that crushes to loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; somewhat poorly drained to moderately well drained Colfax soils; poorly drained Fluvaquents; moderately well drained Helena soils; well drained Pacolet, Vance, Varina, and Wedowee soils; and poorly drained Worsham soils. The Abell and Colfax soils are along small drainageways and at the head of drainageways. The Helena soils are on the upper part of some side slopes. The Pacolet, Vance, Varina, and Wedowee soils are scattered throughout the mapped areas. The Fluvaquents and the Worsham soils are along drainageways. Also included, in spots, are severely eroded soils that have a surface layer of red clay loam. The included soils make up 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. Moderate permeability and slope are also limitations to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

21D2—Cullen loam, 15 to 25 percent slopes, eroded. This is a moderately steep, well drained soil on narrow, convex side slopes along drainageways. Slopes are smooth and complex and are about 80 to 200 feet long. Areas are commonly long and winding. They range in size from 5 acres to more than 10 acres.

Typically, the surface layer is reddish brown loam about 5 inches thick. The subsoil is about 35 inches thick. It is mostly red and dark red, firm, plastic clay. The substratum to a depth of about 60 inches is dark red, red, yellowish red, pinkish white, and black, weathered hornblende gneiss that crushes to loam.

Included in mapping are small areas of well drained to excessively drained Ashlar soils; poorly drained Fluvaquents; and well drained Pacolet, Vance, and Wedowee soils. The Ashlar soils are mainly on the lower part of side slopes. The Fluvaquents are along drainageways and small streams. The Pacolet and Wedowee soils are scattered throughout the mapped areas. The Vance soils are mainly on the upper part of side slopes. Also included, in spots, are severely eroded soils that have a clay loam surface layer. The included soils make up 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

This soil is limited for many urban uses and for use as septic tank absorption fields by slope. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

22—Dawhoo Variant fine sandy loam. This is a nearly level, very poorly drained soil. It is in slightly concave, elongated and irregularly oval areas in old stream channels and in low-lying depressions on terraces, and in small, filled oxbow lakes. These areas are along the larger streams on the eastern part of the Piedmont and on the Coastal Plain. They are 150 to 600 feet wide and range in size from about 5 to 15 acres.

Typically, the surface layer is black fine sandy loam and gravelly loamy sand about 20 inches thick. The substratum to a depth of about 63 inches is mostly dark gray, loose, nonplastic gravelly loamy sand in the upper part and dark greenish gray, friable, slightly plastic sandy clay loam in the lower part.

Included in mapping are small areas of poorly drained Forestdale and Wehadkee soils. These soils are scattered throughout the mapped areas. Also included, in spots, are very poorly drained soils that have a surface layer of gravelly sandy loam and loamy sand. The included soils make up about 15 percent of this map unit.

Permeability is rapid, and the available water capacity is low. Runoff is slow. Tilth is good, but the soil is wet in spring and early in summer. Natural fertility is low, and the content of organic matter is high. The substratum is mostly nonplastic and has a low shrink-swell potential. The root zone extends to a depth of about 24 to 30 inches; root growth is severely limited below this depth by the water table. The surface layer and the substratum are medium acid to neutral. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is frequently flooded, and it is ponded for brief periods, especially in winter and spring.

This soil is not suited to cultivated crops, and it is poorly suited to pasture and hay unless it is artificially drained and protected from flooding and ponding. Artificial drainage is difficult because of a lack of suitable outlets.

If this soil is used as pasture, establishing and maintaining a desirable mixture of water tolerant grasses and legumes, overgrazing, and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, the use of fertilizer to offset the low natural fertility of the soil, and artificial drainage can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are water-tolerant hardwoods, for which the hazard of seedling mortality is severe. The potential productivity is very high. The use of equipment generally needed in woodland management or harvesting is severely limited by wetness.

This soil is limited for most urban uses because of a high water table and flooding and ponding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass VIw.

23—Dogue loam. This is a nearly level, moderately well drained soil in broad, irregularly rectangular, low-lying areas on the Coastal Plain uplands. The areas are about 120 to 1,000 feet wide and 5 to more than 50 acres in size.

Typically, the surface layer is dark grayish brown loam about 11 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown and yellowish brown, firm, plastic clay. The substratum to a depth of about 99 inches is strong brown, yellowish brown, brown, red, and gray clay, sandy clay loam, and sandy loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Altavista, Atlee, Bourne, Duplin, and Goldsboro soils; well drained Caroline, Kempsville, Masada, and Norfolk soils; somewhat poorly drained to moderately well drained Colfax soils; somewhat poorly drained Wahee soils; and poorly drained Forestdale soils. The Abell, Caroline, Kempsville, Masada, and Norfolk soils are slightly higher on the landscape than the Dogue soil. The Altavista, Atlee, Bourne, Duplin, and Goldsboro soils are scattered throughout the mapped areas. The Colfax, Wahee, and Forestdale soils are along drainageways and streams. The included soils make up about 15 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable

grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. Trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and moderately slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

24—Dunbar fine sandy loam. This is a nearly level, somewhat poorly drained soil in broad, low-lying areas on the Coastal Plain. Areas are commonly irregularly rectangular or irregularly oval and in many places, slightly concave. They are about 200 to more than 1,000 feet wide and 5 to more than 40 acres in size. Many areas of this soil surround areas of poorly drained soils.

Typically, the surface layer is dark grayish brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 65 inches is mostly gray, firm, plastic clay with mottles of brighter colors.

Included in mapping are small areas of moderately well drained Atlee, Bourne, Duplin, and Dogue soils; well drained Caroline and Norfolk soils; and poorly drained Coxville soils. The Atlee, Bourne, Caroline, Duplin, Dogue, and Norfolk soils are slightly higher on the landscape than the Dunbar soil throughout the mapped areas. The Coxville soils are mainly along small drainageways and in slightly concave areas. Also included, in spots, are soils that have a loam subsoil and soils that have a thin brittle layer in the subsoil. The included soils make up about 10 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed (fig. 3).

Figure 3.—Summer ponding on somewhat poorly drained Dunbar fine sandy loam. Artificial drainage is recommended for most uses.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and moderately slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

25A—Duplin fine sandy loam, 0 to 2 percent slopes. This is a nearly level, moderately well drained soil on broad ridgetops and on broad, slightly concave upland flats on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and are 200 to 1,600 feet wide. They range in size from about 4 acres to more than 50 acres.

Typically, the surface layer is olive gray and light olive brown fine sandy loam about 9 inches thick. The subsoil to a depth of about 72 inches is mostly yellowish brown and olive gray, firm, plastic clay loam and clay.

Included in mapping are small areas of moderately well drained Bourne and Goldsboro soils, somewhat poorly drained Dunbar soils, poorly drained Coxville soils, poorly drained Fluvaquents, and well drained Faceville, Norfolk, Orangeburg, and Varina soils. The Bourne, Faceville, Norfolk, Orangeburg, and Varina soils are slightly higher on the landscape than the Duplin soil throughout the mapped areas. The Goldsboro soils are along small drainageways. The Coxville and Dunbar soils and the Fluvaquents are along drainageways and small streams and in slightly concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. About one-half of the acreage of this soil is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and about one-half of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and moderately slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

25B—Duplin fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, moderately well drained soil on broad, slightly convex ridgetops on the Coastal Plain. Slopes are smooth and about 200 to 1,000 feet long. Areas are elongated, irregularly rectangular, or irregularly oval; and they range in size from 4 acres to more than 50 acres.

Typically, the surface layer is olive gray and light olive brown fine sandy loam about 9 inches thick. The subsoil to a depth of 72 inches is mostly yellowish brown and olive gray, firm, plastic clay loam and clay.

Included in mapping are small areas of moderately well drained Bourne and Goldsboro soils, somewhat poorly drained Dunbar soils, poorly drained Coxville soils, poorly drained Fluvaquents, and well drained Faceville, Norfolk, Orangeburg, and Varina soils. The Bourne, Faceville, Norfolk, Orangeburg, and Varina soils are slightly higher on the landscape than the Duplin soil throughout the mapped areas. The Goldsboro soils are along small drainageways. The Coxville and Dunbar soils and the Fluvaquents are along drainageways and small streams and in slightly concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderately slow, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. About two-thirds of the acreage of this soil is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used for pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and about one-third of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and moderately slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

26B—Edgehill Variant very gravelly sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on convex, finger-shaped ridges and narrow, slightly convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 200 feet long. Areas are elongated. They range in size from 5 to 15 acres.

Typically, the surface layer is very dark grayish brown and olive very gravelly sandy loam about 18 inches thick. The subsoil to a depth of about 64 inches is mostly strong brown and red, friable, plastic very gravelly sandy clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne, Creedmoor, Duplin, and Goldsboro soils; poorly drained Coxville soils; well drained Faceville, Norfolk, Orangeburg, and Varina soils; and well drained to excessively drained Pinkston soils. The Abell soils are in saddles and along small drainageways. The Bourne, Creedmoor, and Duplin soils are on small flats and along small drainageways. The Goldsboro soils are along small drainageways. The Coxville soils are in slightly concave areas. The Faceville, Norfolk, Orangeburg, and Varina soils are scattered throughout the mapped areas. The Pinkston soils are mainly on the lower part of side slopes. The included soils make up 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is low. Runoff is medium. Erosion is a moderate hazard. Tilth is poor, and there are enough pebbles and cobblestones in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil is plastic but has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of the soil.

This soil is poorly suited to cultivated crops and moderately well suited to pasture and hay. The pebbles in the surface layer can interfere with tillage and planting and damage farm equipment. The soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for some urban uses because of its moderate permeability and the pebble content of the surface layer. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIs.

27B—Fluvanna silt loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on somewhat

broad, convex ridgetops. Slopes are smooth, commonly complex, and about 100 to 400 feet long. Areas are commonly long and winding. They range in size from 5 to more than 30 acres.

Typically, the surface layer is very dark gray and light yellowish brown silt loam about 9 inches thick. The subsoil is about 50 inches thick. It is mostly yellowish red, firm, plastic clay that is strongly mottled. The substratum to a depth of about 70 inches is yellowish red, light gray, yellowish brown, and red clay loam.

Included in mapping are small areas of somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; well drained Georgeville soils; and moderately well drained Bourne and Helena soils. The Colfax, Iredell, and Orange soils are along small drainageways and in slightly concave areas. The Georgeville soils are mainly along the crest of ridges. The Bourne and Helena soils are mainly on small flats. The included soils make up 10 to 15 percent of this map unit.

Permeability is moderately slow to slow, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderately slow to slow permeability and the low strength of the clay subsoil. Moderately slow to slow permeability is also a limitation to the use of this soil as septic tank absorption fields. Low strength is also a limitation to the use of this soil as sites for houses and other small structures. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

27C2—Fluvanna silt loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes. Slopes are smooth, commonly complex, and 80 to 400 feet long. Areas are commonly long and winding. They range in size from 5 acres to more than 20 acres.

Typically, the surface layer is very dark gray and light yellowish brown silt loam about 4 inches thick. The subsoil is about 50 inches thick. It is mostly yellowish red, firm, plastic clay that is strongly mottled. The substratum to a depth of about 65 inches is yellowish red, light gray, yellowish brown, and red clay loam.

Included in mapping are small areas of somewhat poorly drained to moderately well drained Colfax and Orange soils, poorly drained Fluvaquents, well drained Georgeville soils, and moderately well drained Helena soils. The Colfax and Orange soils are around the head of drainageways and along small drainageways. The Fluvaquents are along drainageways and small streams. The Georgeville soils are scattered throughout the mapped areas. The Helena soils are mainly on the upper part of side slopes. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderately slow to slow, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderately slow to slow permeability and low strength of the clay subsoil. Moderately slow to slow permeability is also a limitation to the use of this soil as septic tank absorption fields. Low strength is also a limitation to the use of this soil as sites for houses and other small structures. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

28—Fluvaquents, nearly level. These are nearly level, poorly drained soils on narrow to broad flood plains along streams and large drainageways on the Piedmont and the Coastal Plain. Areas are commonly long and narrow or irregularly oval. They range from about 100 feet to more than 1,000 feet in width.

In general, the surface layer is gray or dark gray loamy sand to clay loam. The substratum in many places is strongly gleyed and is gray, greenish gray, or bluish gray with brighter mottles. It ranges from sand to clay. In many places, a mat of partly decayed organic matter covers the surface. In some places, the surface layer or the substratum, or both, are gravelly or very gravelly.

Included in mapping are small areas of moderately well drained to well drained Abell soils; somewhat poorly drained to moderately well drained Colfax soils; somewhat poorly drained Chewacla soils; moderately well drained Helena, Kenansville Variant, and Goldsboro soils; moderately well drained to well drained Udifluvents; and poorly drained Worsham soils. These soils are scattered throughout the mapped areas. Also included are small areas of soils that are continuously waterlogged and soils that are ponded for prolonged periods, and small areas of open water. The inclusions make up about 10 to 15 percent of this map unit.

Permeability is rapid to moderately slow, and the available water capacity is low to moderate. Runoff is slow. Tilth is poor. These soils are wet or waterlogged for periods in winter, spring, and summer. They are commonly flooded for long periods from December to May, and after large storms.

These soils are not suited to cultivated crops or to hay unless they are artificially drained and protected from flooding. They are poorly suited to pasture because of flooding and wetness.

These soils are suited to trees, and most of the acreage is wooded. The potential productivity is moderately high. The trees are pine and hardwoods, for which the hazard of seedling mortality is severe. Windthrow is a moderate hazard. The use of equipment generally needed in woodland management or harvesting is moderately limited by wetness.

These soils are limited for most urban uses because of flooding and wetness. They are a poor source of subgrade material for local roads and streets.

This map unit is not assigned to a capability subclass.

29—Forestdale loam. This is a nearly level soil on broad, low-lying upland flats on the Piedmont. Areas are irregularly rectangular or irregularly oval, commonly concave, and about 200 to more than 1,000 feet wide. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark grayish brown loam about 8 inches thick. The subsoil is about 38 inches thick. It is mostly gray, firm, plastic clay. The substratum to a depth of about 60 inches is light gray fine sandy loam.

Included in mapping are small areas of moderately well drained Bourne, Dogue, and Helena soils; somewhat poorly drained to moderately well drained Colfax and Orange soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Bourne, Dogue, Helena, Colfax, and Orange soils are mainly slightly higher on the landscape than the Forestdale soil; they are along the edges of the mapped areas. The Fluvaquents and the Worsham soils are along small drainageways. The included soils make up about 15 percent of this map unit.

Permeability is very slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but the soil is wet and cold in spring and early in summer. Natural fertility and the content of organic matter are moderate. The subsoil is plastic and has a high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by wetness below a depth of about 35 inches. The surface layer and the subsoil are very strongly acid to mildly alkaline below a depth of about 20 inches. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is very poorly suited to cultivated crops and moderately well suited to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The acidity and moderate natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and the moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine and hardwoods, for

which the hazard of seedling mortality is moderate. The potential productivity is very high. The use of equipment generally needed in woodland management or harvesting is severely limited by long periods of wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass Vw.

30—Forestdale loam, frequently flooded. This is a nearly level soil on broad, low-lying terraces along the larger streams on the Piedmont and the Coastal Plain. Most areas are elongated; some small areas are irregularly oval and slightly concave. Areas range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark grayish brown loam about 8 inches thick. The subsoil is about 38 inches thick. It is mostly gray, firm, plastic clay. The substratum to a depth of about 60 inches is light gray fine sandy loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, moderately well drained Altavista and Bolling Variant soils, somewhat poorly drained Dunbar soils, somewhat poorly drained to moderately well drained Iredell and Orange soils, well drained Cullen and Vance soils, and poorly drained Fluvaquents. The Fluvaquents are mainly along drainageways and streams. The other soils are mainly along the edges of the mapped areas, next to the uplands. Also included are spots of very poorly drained soils, small areas of ponded soils, and areas of soils that have a surface layer of clay loam. The included soils make up about 15 percent of this map unit.

Permeability is very slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but the soil is wet and cold in spring and early in summer. Natural fertility and the content of organic matter are moderate. The subsoil is plastic and has a high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by wetness below a depth of about 35 inches. The surface layer and the subsoil range from very strongly acid to mildly alkaline, but the subsoil is commonly neutral to mildly alkaline below a depth of about 20 inches. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is frequently flooded for long periods in winter and spring.

This soil is not suited to cultivated crops. It is moderately well suited to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The acidity and moderate natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and wetness and flooding are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and the moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is very high. The use of equipment generally needed in woodland management or harvesting is severely limited by long periods of wetness and flooding.

This soil is severely limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass Vw.

31—Fork fine sandy loam. This is a nearly level, somewhat poorly drained soil on narrow to somewhat broad, low-lying terraces along the larger streams on the Piedmont and the Coastal Plain. Most areas are elongated; some small areas are irregularly oval and slightly concave. Areas range in size from 5 to 15 acres.

Typically, the surface layer is dark grayish brown and light olive brown fine sandy loam about 18 inches thick. The subsoil is about 24 inches thick. It is mostly olive gray, strongly mottled, friable, plastic sandy clay loam. The substratum to a depth of about 64 inches is olive gray and strong brown loamy sand.

Included in mapping are small areas of moderately well drained Altavista and Dogue soils, somewhat poorly drained Chewacla and Wahee soils, well drained Pamunkey soils, poorly drained Fluvaquents, and poorly drained Wehadkee soils. The Altavista, Dogue, and Pamunkey soils are slightly higher on the landscape than the Fork soil throughout the mapped areas. The Wahee soils are scattered throughout the mapped areas. The Chewacla and Wehadkee soils and the Fluvaquents are along drainageways and streams. Also included, in spots, are gravelly soils, sandy soils, and extremely acid soils. The included soils make up about 10 to 15 percent of the map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are moderate. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly medium acid unless lime

has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is occasionally flooded for very brief periods in spring and early in summer.

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. The moderate content of organic matter, the acidity, and the moderate natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and the moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a large acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for many urban uses because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

32B—Georgeville loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly elongated. They range in size from 4 acres to more than 10 acres.

Typically, the surface layer is dark brown loam about 10 inches thick. The subsoil is about 46 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 93 inches is yellowish brown, light red, and weak red silty clay loam.

Included in mapping are small areas of well drained Fluvanna and Pacolet soils and somewhat poorly drained to moderately well drained Colfax soils. These soils are scattered throughout the mapped areas. Also included, in spots, are gravelly soils or severely eroded soils that have a surface layer of yellowish red loam or silty clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. About one-fourth of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for some urban uses and for use as septic tank absorption fields because of its moderate permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

32C2—Georgeville loam, 7 to 20 percent slopes, eroded. This is a sloping to moderately steep, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly elongated. They range in size from 4 acres to more than 10 acres.

Typically, the surface layer is dark brown loam about 5 inches thick. The subsoil is about 46 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 88 inches is yellowish brown, light red, and weak red silty clay loam.

Included in mapping are small areas of poorly drained Fluvaquents and well drained Fluvanna and Pacolet soils. The Fluvaquents are along small drainageways. The Fluvanna and Pacolet soils are scattered throughout the mapped areas. Also included, in spots, are gravelly soils or severely eroded soils that have a surface layer of yellowish red loam and silty clay loam. The included soils make up 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but natural fertility and the

content of organic matter are low. The subsoil is plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for urban uses and for use as septic tank absorption fields because of its moderate permeability and slope. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

33B—Goldsboro fine sandy loam, 0 to 4 percent slopes. This is a nearly level to very gently sloping, moderately well drained soil. It is in slightly concave, irregularly oval areas in upland depressions and at the head of drainageways and on the slightly concave lower part of side slopes along drainageways on the Coastal Plain. Areas are about 100 to 800 feet wide and 4 to 20 acres in size. Slopes are commonly smooth.

Typically, the surface layer is dark grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil is about 59 inches thick. It is mostly yellowish brown, friable, slightly plastic sandy clay loam. It is mottled with gray between depths of about 22 and 43 inches and is mostly gray below a depth of about 43 inches. The substratum to a depth of about 90 inches is gray and yellowish brown sandy loam.

Included in mapping are small areas of moderately well drained Altavista, Bourne, Dogue, and Duplin soils; somewhat poorly drained Augusta and Dunbar soils; poorly drained Fluvaquents; and well drained Caroline, Kempsville, and Norfolk soils. The Altavista, Bourne, Dogue, and Duplin soils are scattered throughout the mapped areas. The Augusta soils and the Fluvaquents are along drainageways and streams. The Dunbar soils are in slightly concave areas. The Caroline, Kempsville, and Norfolk soils are slightly higher on the landscape than the Goldsboro soil. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

34B—Goldsboro fine sandy loam, overwash, 0 to 4 percent slopes. This is a nearly level to very gently sloping, moderately well drained soil. It is in slightly concave, irregularly oval areas in upland depressions and at the head of drainageways and on the slightly concave lower part of side slopes along drainageways on the Coastal Plain. Slopes are commonly smooth. Areas are about 100 to 500 feet wide and 4 to more than 10 acres in size.

Typically, the surface layer is made up of grayish brown, yellowish brown, and light olive brown fine sandy loam outwash about 8 to 14 inches thick and, beneath that, dark grayish brown and light yellowish brown fine

sandy loam about 10 inches thick. The subsoil is about 59 inches thick. It is mostly yellowish brown, friable, slightly plastic sandy clay loam. It is mottled with gray between depths of about 32 and 53 inches and is mostly gray below a depth of about 53 inches. The substratum to a depth of about 90 inches is gray and yellowish brown sandy loam.

Included in mapping are small areas of moderately well drained Altavista, Dogue, and Duplin soils; somewhat poorly drained Augusta and Lenoir soils; and poorly drained Fluvaquents. The Altavista, Dogue, and Duplin soils are scattered throughout the mapped areas. The Augusta and Lenoir soils and the Fluvaquents are adjacent to drainageways and streams and in slightly concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. The hazard of erosion is slight. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture. It is also well suited to hay; however, alfalfa is often short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

35B—Helena-Colfax complex, 2 to 7 percent slopes. This complex consists of gently sloping, moderately well drained to somewhat poorly drained soils on broad, slightly convex ridgetops and in irregularly oval, slight depressions. Slopes are smooth, commonly complex, and about 200 to 1,500 feet long. Areas range in size from about 4 acres to more than 100 acres.

This complex is about 40 percent moderately well drained Helena sandy loam and 35 percent somewhat poorly drained to moderately well drained Colfax fine sandy loam. Included soils make up the rest. The Colfax soil is mainly in the depressions and along small finger-shaped drainageways on the ridgetops.

Typically, the surface layer of the Helena soil is olive brown and light olive brown sandy loam about 6 inches thick. The subsoil is about 41 inches thick. It is mostly strong brown and gray clay. The substratum to a depth of about 60 inches is light olive gray clay loam. The surface layer of the Colfax soil is dark grayish brown and light yellowish brown fine sandy loam about 8 inches thick. The subsoil in the upper 16 inches is mostly light olive brown sandy clay loam. Below that, to a depth of about 60 inches, it is a fragipan consisting of gray and light gray, brittle and compact fine sandy loam and sandy loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Altavista soils; poorly drained Aquults and Fluvaquents; well drained Appling, Fluvanna, Pacolet, Vance, and Wedowee soils; somewhat poorly drained to moderately well drained Orange soils; somewhat poorly drained Wahee soils; and poorly drained Forestdale and Worsham soils. The Abell soils are mainly along small drainageways. The Altavista, Forestdale, Wahee, and Worsham soils and the Fluvaquents are along drainageways and streams. The Aquults and Orange soils are mainly on small flats. The Appling, Fluvanna, Pacolet, Vance, and Wedowee soils are slightly higher on the landscape than the Helena soil and the Colfax soil. Also included, in spots scattered throughout the mapped areas, are soils that are underlain by bedrock at a depth of 12 to 36 inches.

Permeability is slow, and the available water capacity is moderate to low. Runoff is medium. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil has a moderate to high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by a very firm clay subsoil or a fragipan at a depth of about 18 to 34 inches. The surface layer and the subsoil are strongly acid to very strongly acid unless limed. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Alfalfa is short-lived because of seasonal wetness and restricted root growth. The soils are droughty during the growing

season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and the low available water capacity of the Colfax soil are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

These soils are limited for urban uses and for use as septic tank absorption fields mainly because of slow permeability, high shrink-swell potential in the subsoil, and a seasonal high water table. The soils in this complex are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

36C—Helena-Orange complex, 7 to 15 percent slopes. This complex consists of sloping, moderately well drained to somewhat poorly drained soils on narrow, convex side slopes along drainageways. Slopes are smooth and complex and about 150 to 400 feet long. Areas are commonly elongated and somewhat winding. They range in size from 4 acres to more than 40 acres.

This complex is about 40 percent moderately well drained Helena sandy loam and 35 percent somewhat poorly drained to moderately well drained Orange fine sandy loam. Included soils make up the rest.

Typically, the surface layer of the Helena soil is olive brown and light olive brown sandy loam about 6 inches thick. The subsoil is about 41 inches thick. It is mostly strong brown and gray clay. The substratum to a depth of about 60 inches is light olive gray clay loam. The surface layer of the Orange soil is dark gray and light brownish gray fine sandy loam about 6 inches thick. The subsoil is about 36 inches thick. It is mostly yellowish brown, light olive brown, and gray clay. The substratum to a depth of about 60 inches is gray, strong brown, and yellowish brown sandy loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils, somewhat poorly drained to moderately well drained Colfax soils, poorly drained Fluvaquents, well drained Vance soils, and poorly drained Worsham soils. The Abell and Worsham soils and the Fluvaquents are adjacent to drainageways. The Colfax soils are scattered throughout the mapped areas. The Vance soils are mainly on the upper part of the side slopes.

Permeability is slow, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is very plastic and has high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by the very firm clay subsoil at a depth of about 19 to 30 inches. The surface layer and the subsoil are very strongly acid to moderately alkaline unless limed. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are poorly suited to cultivated crops and moderately well suited to pasture and hay. Alfalfa is short-lived because of seasonal wetness and restricted root growth. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees. The trees are pine and hardwoods. The potential productivity is moderate to moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

These soils are limited for urban uses and for use as septic tank absorption fields mainly because of the slow permeability, the high shrink-swell potential in the subsoil, and a seasonal high water table. They are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass IVe.

37—Hydraquents, nearly level. These are nearly level, very poorly drained soils that formed in alluvium in low-lying areas along the larger streams. The soils are covered periodically by floodwater or tidal water. They are continuously waterlogged, except during extended

dry periods late in fall. Slopes range from 0 to 2 percent. Areas are elongated, irregularly oval, or irregularly rectangular. They are 150 to 800 feet wide and 4 to 50 acres in size.

These soils consist of layers of sandy, loamy, clayey, and mucky material. The surface layer is commonly gray or black. In most places it is mucky. The substratum is gray, greenish gray, or bluish gray. Layers of dark gray or black mucky material are at various depths.

Included in mapping, in spots, are soils that are higher on the landscape than the Fluvaquents. In many spots, these included soils support water-tolerant trees. Also included are small areas of water.

Most of these soils are covered by reeds, cattail, arrowleaf, rush, and other aquatic plants.

This map unit is not assigned to a capability subclass.

38C—Iredell-Orange complex, 7 to 15 percent slopes. This complex consists of sloping, moderately well drained to somewhat poorly drained soils on narrow to somewhat broad side slopes along drainageways. Slopes are smooth and complex and about 150 to 600 feet long. Areas are elongated and somewhat winding. They range in size from 4 acres to more than 40 acres.

This complex is about 40 percent Iredell sandy loam and 30 percent Orange fine sandy loam. Included soils make up the rest.

Typically, the surface layer of the Iredell soil is dark grayish brown and yellowish brown sandy loam about 9 inches thick. The subsoil is about 25 inches thick. It is mostly yellowish brown and pale olive, very firm, very plastic clay. The substratum to a depth of about 90 inches, is olive, strong brown, white, and black sandy clay loam. The surface layer of the Orange soil is dark gray and light brownish gray fine sandy loam about 6 inches thick. The subsoil is about 36 inches thick. It is mostly yellowish brown, light olive brown, and gray, very firm, very plastic clay. The substratum to a depth of about 60 inches is gray, strong brown, and yellowish brown sandy loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Helena soils; somewhat poorly drained to moderately well drained Colfax soils; well drained Cecil, Cullen, Pacolet, and Vance soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are mainly along small drainageways. The Helena and Colfax soils are scattered throughout the mapped areas. The Cecil, Cullen, Pacolet, and Vance soils are slightly higher on the landscape than the Iredell soil and the Orange soil. The Fluvaquents and the Worsham soils are adjacent to drainageways and streams. Also included, in spots, are soils that have surface layers of clay loam, clay, and gravelly fine sandy loam.

Permeability is slow, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair. Natural fertility is moderate, and the content of organic matter is low. The subsoil is very plastic and has high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by the very firm clay subsoil at a depth of about 9 to 19 inches. The surface layer and the subsoil range from strongly acid to moderately alkaline unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are poorly suited to cultivated crops and moderately well suited to pasture and hay. Alfalfa is short-lived because of seasonal wetness and restricted root growth. Erosion is a major management problem. The low content of organic matter, the acidity, and the moderate natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

These soils are limited for urban uses and for use as septic tank absorption fields mainly because of the slow permeability, the high shrink-swell potential of the subsoil, and a seasonal high water table. They are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass IVe.

39B—Kempsville gravelly fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow, convex ridgetops on the Coastal Plain. Slopes are smooth and complex and about 150 to 400 feet long. Areas are elongated or long and winding. They are 5 to more than 20 acres in size.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 9 inches thick. The subsoil is about 47 inches thick. It is mostly yellowish red, firm, plastic gravelly sandy clay loam that is strongly mottled. The substratum to a depth of about 70 inches is gray, red, and yellowish brown gravelly sandy clay loam.

Included in mapping are small areas of moderately well drained Bourne, Dogue, Duplin, and Goldsboro soils and well drained Caroline, Faceville, Kenansville, Norfolk,

Orangeburg, and Suffolk soils. The Bourne, Caroline, Faceville, Kenansville, Norfolk, Orangeburg, and Suffolk soils are throughout the mapped areas. The Dogue, Duplin, and Goldsboro soils are along small drainageways and on small upland flats. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is generally quite deep to bedrock; therefore, bedrock generally does not affect the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and damage farm equipment.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for some urban uses and for use as septic tank absorption fields because of its moderate permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIs.

39C—Kempsville gravelly fine sandy loam, 7 to 15 percent slopes. This is a sloping, well drained soil on narrow, convex side slopes on the Coastal Plain. Slopes are smooth and complex and about 150 to 400 feet long. Areas are elongated or long and winding. They are 5 to more than 20 acres in size.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 9 inches thick. The subsoil is about 47 inches thick. It is mostly yellowish red, firm, plastic gravelly sandy clay loam that is strongly mottled. The substratum to a depth of about 70 inches is gray, red, and yellowish brown gravelly sandy clay loam.

Included in mapping are small areas of moderately well drained Bourne and Goldsboro soils; well drained Faceville, Orangeburg, and Suffolk soils; and poorly drained Fluvaquents. The Bourne, Faceville, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. The Goldsboro soils are mainly along small drainageways. The Fluvaquents are along drainageways and streams. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer can interfere somewhat with tillage and planting and damage farm equipment.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability and slope. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIs.

40A—Kempsville-Bourne fine sandy loams, 0 to 2 percent slopes. This complex consists of nearly level, well drained and moderately well drained soils on broad ridgetops. Areas are commonly irregularly rectangular and about 200 to more than 1,200 feet wide. They range in size from 4 to 40 acres.

This complex is about 55 percent Kempsville soil and about 30 percent Bourne soil. Included soils make up the rest.

Typically, the surface layer of the Kempsville soil is very dark grayish brown and dark yellowish brown fine sandy loam about 12 inches thick. The subsoil to a depth of about 60 inches is mostly yellowish brown, brown, and strong brown, friable, slightly plastic sandy clay loam. A mottled, somewhat brittle and compact layer is between depths of about 29 and 39 inches. The surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil is about 55 inches thick. In the upper 11 inches it is yellowish brown, friable, slightly plastic sandy clay loam. In the lower 44 inches it is a fragipan consisting of light yellowish brown and gray, brittle and compact, nonplastic sandy loam. The substratum is white, very firm and very plastic clay.

Included in mapping are small areas of somewhat poorly drained Dunbar soils; moderately well drained Duplin and Goldsboro soils; poorly drained Fluvaquents; and well drained Faceville, Kenansville, Norfolk, Orangeburg, and Suffolk soils. The Dunbar, Duplin, and Goldsboro soils are in slightly concave areas and along small drainageways. The Fluvaquents are along drainageways and streams. The Faceville, Kenansville, Norfolk, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of loamy sand.

Permeability is moderate in the Kempsville soil and slow to very slow in the Bourne soil. The available water capacity is moderate in the Kempsville soil and low in the Bourne soil. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone of the Kempsville soil extends to a depth of about 60 inches; but root growth is slightly limited by the somewhat brittle and compact layer at a depth of about 29 inches. The root zone of the Bourne soil extends to a depth of about 24 inches; root growth is severely limited by the fragipan, which is commonly at a depth of about 18 to 34 inches. The surface layer and the subsoil of these soils are strongly acid to very strongly acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Alfalfa is short-lived on the Bourne soil because of seasonal wetness and restricted root growth. The Bourne soil is droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed on the Bourne soil. Erosion is a minor problem.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing the Bourne soil during periods of wetness can cut up and compact the surface soil, thus reducing yields.

The soils in this complex are suited to trees, and some of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high on the Kempsville soil and moderate on the Bourne soil. On the Bourne soil, the use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

The Kempsville soil is limited for some urban uses because of the moderate permeability, and the Bourne soil is limited for these uses because of the slow to very slow permeability and a seasonal high water table. The Kempsville soil is moderately limited for use as septic tank absorption fields because of the moderate permeability, and the Bourne soil is severely limited for this use because of the slow to very slow permeability. These soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIw.

40B—Kempsville-Bourne fine sandy loams, 2 to 7 percent slopes. This complex consists of gently sloping, well drained and moderately well drained soils on broad, convex ridgetops. Slopes are smooth, commonly complex, and about 200 to more than 1,800 feet long. Areas are commonly irregularly rectangular and range in size from 4 acres to more than 100 acres.

This complex is about 60 percent Kempsville soil and 30 percent Bourne soil. Included soils make up the rest.

Typically, the surface layer of the Kempsville soil is very dark grayish brown and dark yellowish brown fine sandy loam about 12 inches thick. The subsoil to a depth of about 60 inches is mostly yellowish brown, brown, and strong brown, friable, slightly plastic sandy clay loam. A mottled, somewhat brittle and compact layer is between depths of about 29 and 39 inches. The surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil is about 55 inches thick. In the upper 11 inches it is yellowish brown, friable, slightly plastic sandy clay loam. In the lower 44 inches it is a fragipan consisting of light yellowish brown and gray, brittle and compact, nonplastic sandy loam. The substratum is white, very firm and very plastic clay.

Included in mapping are small areas of somewhat poorly drained Dunbar soils; moderately well drained

Duplin and Goldsboro soils; poorly drained Fluvaquents; and well drained Faceville, Kenansville, Norfolk, Orangeburg, and Suffolk soils. The Dunbar, Duplin, and Goldsboro soils are in slightly concave areas and along small drainageways. The Fluvaquents are along drainageways and streams. The Faceville, Kenansville, Norfolk, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of loamy sand.

Permeability is moderate in the Kempsville soil and slow to very slow in the Bourne soil. The available water capacity is moderate in the Kempsville soil and low in the Bourne soil. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has low shrink-swell potential. The root zone of the Kempsville soil extends to a depth of about 60 inches, but root growth is slightly limited by a somewhat brittle and compact layer at a depth of about 29 inches. The root zone of the Bourne soil extends to a depth of about 24 inches; root growth is severely limited by the fragipan, which is commonly at a depth of about 18 to 34 inches. The surface layer and the subsoil of these soils are strongly acid to very strongly acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Alfalfa is short-lived on the Bourne soil because of seasonal wetness and restricted root growth. The Bourne soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed on the Bourne soil.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

The soils in this complex are suited to trees, and some of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high on the Kempsville soil and moderate on the Bourne soil. On the Bourne soil, the use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

The Kempsville soil is limited for some urban uses because of the moderate permeability, and the Bourne soil is limited for these uses because of the slow to very slow permeability and a seasonal high water table. The Kempsville soil is moderately limited for use as septic tank absorption fields because of the moderate permeability, and the Bourne soil is severely limited for this use because of the slow to very slow permeability. These soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

41—Kenansville loamy sand, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops on the Coastal Plain. Slopes are smooth and complex and about 80 to 300 feet long. Areas are commonly long and winding. They are 4 to more than 20 acres in size.

Typically, the surface layer is dark grayish brown, light yellowish brown, and yellowish brown loamy sand about 21 inches thick. The subsoil is about 27 inches thick. It is mostly yellowish brown and strong brown, friable, nonplastic and slightly plastic sandy loam and sandy clay loam. The substratum to a depth of about 99 inches is strong brown loamy sand.

Included in mapping are small areas of moderately well drained Dogue and Goldsboro soils and well drained Kempsville, Norfolk, Orangeburg, and Suffolk soils. The Dogue soils are on small upland flats and along drainageways. The Goldsboro soils are along small drainageways. The Kempsville, Norfolk, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderately rapid, and the available water capacity is low. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is nonplastic to slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. The soil is droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are management problems. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and

the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine, for which the hazard of seedling mortality is moderate. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by the loamy sand surface layer.

This soil has slight limitations for urban uses and for use as septic tank absorption fields. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIs.

42—Kenansville Variant loamy sand. This is a nearly level, moderately well drained soil on low-lying terraces, on flood plains, and at the head of drainageways on the Coastal Plain. Areas are elongated or irregularly oval and slightly concave. They are about 180 to 400 feet wide and about 4 to 10 acres in size.

Typically, the surface layer is very dark grayish brown and yellowish brown loamy sand about 21 inches thick. The subsoil is about 13 inches thick. It is mostly pale brown and strong brown, very friable, slightly plastic loamy sand and fine sandy loam that is strongly mottled. The substratum to a depth of about 76 inches is gray, strong brown, yellowish brown, and white loamy sand and sand.

Included in mapping are small areas of moderately well drained Altavista soils, somewhat poorly drained Augusta soils, poorly drained Fluvaquents, well drained Suffolk soils, and poorly drained Wehadkee soils. The Altavista soils are scattered throughout the mapped areas. The Augusta soils are in lower lying slightly concave areas. The Fluvaquents and the Wehadkee soils are along drainageways. The Suffolk soils are slightly higher on the landscape than the Kenansville soil. The included soils make up about 15 percent of the map unit.

Permeability is moderately rapid, and the available water capacity is low. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is nonplastic to slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. The soil is occasionally flooded for very brief periods in spring and early in summer.

This soil is well suited to cultivated crops and to pasture and hay. The soil is droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and much of the acreage is wooded. The potential productivity is high. Most of the trees are pine, for which the hazard of seedling mortality is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by the loamy sand surface layer.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and flooding. It is a good source of fill for local roads and streets.

This map unit is in capability subclass IIw.

43—Lenoir loam. This is a nearly level, somewhat poorly drained soil on broad, slightly concave ridgetops and in slight depressions on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and about 200 to 1,000 feet wide. They range in size from about 5 acres to more than 50 acres.

Typically, the surface layer is gray and light brownish gray loam about 9 inches thick. The subsoil is about 75 inches thick. It is mostly olive gray and gray, very firm, plastic clay. The substratum to a depth of about 99 inches is brownish yellow and gray clay and sandy clay loam.

Included in mapping are small areas of poorly drained Coxville soils, somewhat poorly drained Dunbar soils, and moderately well drained Dogue and Duplin soils. The Coxville soils are along small drainageways and near the center of depressions. The Dunbar soils are scattered throughout the mapped areas. The Dogue and Duplin soils are slightly higher on the landscape than the Lenoir soil, mainly along the edges of the mapped areas. Also included, in spots, are extremely acid soils. The included soils make up about 15 percent of this map unit.

Permeability is slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay;

however, alfalfa is short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a large acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

This soil is limited for urban uses and for use as septic tank absorption fields because of a seasonal high water table and slow permeability. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

44B—Masada fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on somewhat broad, convex high stream terraces. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are elongated or irregularly rectangular. They range in size from 4 acres to more than 10 acres.

Typically, the surface layer is light olive brown fine sandy loam about 8 inches thick. The subsoil is about 52 inches thick. It is mostly strong brown, yellowish red, and yellowish brown, strongly mottled, firm, plastic clay loam and clay. The substratum to a depth of about 67 inches is strong brown, yellowish brown, and light brownish gray sandy loam.

Included in mapping are small areas of moderately well drained Altavista soils and well drained Appling, Cecil, Pacolet, and Turbeville soils. The Altavista soils are along small drainageways. The Appling, Cecil, and Pacolet soils are mainly on the crest of ridges and along the edges of the mapped areas. The Turbeville soils are scattered throughout the mapped areas. The included soils make up 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and some of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for urban uses because of its moderate permeability and moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

45B—Mayodan-Creedmoor complex, 2 to 7 percent slopes. This complex consists of gently sloping, well drained and moderately well drained soils on narrow to somewhat broad, convex ridgetops on the Piedmont. Slopes are smooth and complex and about 100 to 400 feet wide. Areas are commonly long and winding. They range in size from 4 acres to more than 50 acres.

This complex is about 35 percent Mayodan sandy loam and about 30 percent Creedmoor fine sandy loam. Included soils make up the rest.

Typically, the surface layer of the Mayodan soil is dark grayish brown and yellowish brown sandy loam about 8 inches thick. The subsoil is about 39 inches thick. It is mostly yellowish red, firm, plastic clay. The substratum to a depth of about 89 inches is yellowish red and strong brown sandy clay loam and clay loam. The surface layer of the Creedmoor soil is very dark grayish brown and light yellowish brown fine sandy loam about 11 inches thick. The subsoil is about 28 inches thick. It is mostly very firm, very plastic clay that is yellowish brown in the upper part and gray in the lower part. The substratum to a depth of about 88 inches is gray sandy clay in the upper part and gray and brown sandy loam in the lower part.

Included in mapping are small areas of moderately well drained Bourne and Helena soils, well drained Edgehill Variant soils, poorly drained Fluvaquents, and well drained to excessively drained Pinkston soils. The Bourne and Helena soils are scattered throughout the mapped areas. The Edgehill Variant soils are mainly on the crest of ridges. The Fluvaquents are along small drainageways. The Pinkston soils are on points of ridges and along the lower part of slopes. Also included, in spots, are soils that are underlain by sandstone at a depth of about 32 inches or less.

Permeability is moderate in the Mayodan soil and very slow in the Creedmoor soil. The available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil of the Mayodan soil is plastic and has moderate shrink-swell potential. The subsoil of the Creedmoor soil is very plastic and has high shrink-swell potential. The root zone extends to a depth of about 60 inches; but in the Creedmoor soil, root growth is somewhat limited by the very firm clay subsoil at a depth of about 21 inches. The surface layer and the subsoil of these soils are strongly acid to extremely acid unless lime has been applied. In most places, these soils are deep to bedrock.

The soils in this complex are well suited to cultivated crops and to pasture. They are also well suited to hay; however, alfalfa is short-lived because of seasonal wetness. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited on the Creedmoor soil by seasonal wetness.

These soils are limited for urban uses and for use as septic tank absorption fields because of permeability and shrink-swell potential. They are a fair to poor source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

46—Myatt Variant fine sandy loam. This is a nearly level, poorly drained soil on narrow to somewhat broad, low-lying terraces and flood plains along the larger streams on the Piedmont and the Coastal Plain. Areas are commonly elongated; some smaller areas are irregularly oval and slightly concave. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is very dark grayish brown, light brownish gray, and light gray fine sandy loam about 10 inches thick. The subsoil is about 35 inches thick. It is mostly light brownish gray, friable to firm, slightly plastic to plastic sandy clay loam and clay loam. The substratum to a depth of about 60 inches is light olive gray, light gray, and brownish yellow fine sandy loam.

Included in mapping are small areas of moderately well drained Altavista and Kenansville Variant soils, somewhat poorly drained Augusta and Chewacla soils, poorly drained Fluvaquents, and poorly drained Wehadkee soils. The Altavista, Augusta, and Kenansville Variant soils are slightly higher on the landscape than the Myatt Variant soil; they are mainly along the edges of the mapped areas next to the uplands. The Chewacla and Wehadkee soils and the Fluvaquents are along drainageways and small streams. Also included, in spots, are gravelly soils and very poorly drained soils. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is fair, and natural fertility and the content of organic matter are low. The subsoil is slightly plastic to plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to extremely acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. It is frequently flooded for a brief period in spring and early in summer.

This soil is poorly suited to cultivated crops and to pasture and hay unless it is drained. Alfalfa is short-lived because of seasonal wetness. The low content of organic matter, the acidity, and the low natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a large acreage is wooded. The trees are pine and hardwoods. The poten-

tial productivity is high. The use of equipment generally needed in woodland management or harvesting is severely limited by seasonal wetness. Seedling mortality is a severe hazard, and windthrow is a moderate hazard.

This soil is limited for urban uses because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass Vw.

47A—Norfolk fine sandy loam, 0 to 2 percent slopes. This is a nearly level, well drained soil on broad ridgetops on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and commonly slightly convex. They are about 200 to 1,000 feet wide and range in size from 5 acres to more than 50 acres.

Typically, the surface layer is light olive brown and light yellowish brown fine sandy loam about 14 inches thick. The subsoil to a depth of about 80 inches is mostly yellowish brown and strong brown friable to firm, plastic clay loam that is strongly mottled below a depth of about 44 inches.

Included in mapping are small areas of moderately well drained Atlee, Bourne, Dogue, Duplin, and Goldsboro soils; poorly drained Coxville soils; somewhat poorly drained Dunbar soils; and well drained Faceville, Kempsville, Orangeburg, and Suffolk soils. The Atlee, Bourne, Dogue, Duplin, Faceville, Kempsville, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. The Goldsboro soils are mainly along small drainageways. The Coxville and Dunbar soils are in slightly concave areas and along drainageways. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is high. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Much of the acreage of this soil is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, and a moderate acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is limited for urban uses and for use as septic tank absorption fields because of the moderate permeability. It is a good source of subgrade material for local roads and streets.

This map unit is in capability class I.

47B—Norfolk fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on broad ridgetops on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and commonly slightly convex. They are about 200 to 1,000 feet wide. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is light olive brown and light yellowish brown fine sandy loam about 14 inches thick. The subsoil to a depth of about 80 inches is mostly yellowish brown and strong brown, friable to firm, plastic clay loam that is strongly mottled below a depth of about 44 inches.

Included in mapping west of the Fall Line are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne soils; well drained Cecil, Edgehill Variant, Pacolet, Spotsylvania, Vance, and Wedowee soils; and poorly drained Worsham soils. The Abell and Worsham soils are along small drainageways. The Bourne, Cecil, Edgehill Variant, Pacolet, Spotsylvania, Vance, and Wedowee soils are throughout the mapped areas. Included east of the Fall Line are small areas of moderately well drained Atlee, Bourne, Dogue, Duplin, and Goldsboro soils; poorly drained Coxville soils; somewhat poorly drained Dunbar soils; and well drained Caroline, Faceville, Kempsville, Orangeburg, and Suffolk soils. The Atlee, Bourne, Dogue, Duplin, Caroline, Faceville, Kempsville, Orangeburg, and Suffolk soils are scattered throughout the mapped areas. The Coxville and Dunbar soils are on small upland flats and in slightly concave areas. The Goldsboro soils are along small drainageways. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is high. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can

help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a moderate acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is limited for urban uses and for use as septic tank absorption fields because of the moderate permeability. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

48B—Orange-Iredell complex, 2 to 7 percent slopes. This complex consists of gently sloping, moderately well drained to somewhat poorly drained soils on somewhat broad and broad, slightly convex ridgetops on the Piedmont. Slopes are smooth and complex and about 150 to 600 feet long. Areas are elongated and somewhat winding. They range in size from 4 acres to more than 40 acres.

This complex is about 40 percent Orange fine sandy loam and 30 percent Iredell sandy loam. Included soils make up the rest.

Typically, the surface layer of the Orange soil is dark gray and light brownish gray fine sandy loam about 6 inches thick. The subsoil is about 36 inches thick. It is mostly yellowish brown, light olive brown, and gray, very firm, very plastic clay. The substratum to a depth of about 60 inches is gray, strong brown, and yellowish brown sandy loam. The surface layer of the Iredell soil is dark grayish brown and yellowish brown sandy loam about 9 inches thick. The subsoil is about 25 inches thick. It is mostly yellowish brown and pale olive, very firm, very plastic clay. The substratum to a depth of about 90 inches is olive, strong brown, white, and black sandy clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; somewhat poorly drained to moderately well drained Colfax soils; poorly drained Fluvaquents; well drained Appling, Cecil, Pacolet, Vance, Varina, and Wedowee soils; and poorly drained Forestdale and Worsham soils. The Abell soils are along small drainageways. The Bourne, Helena, Appling, Cecil, Pacolet, Vance, Varina, and Wedowee soils are slightly higher on the landscape than the Orange and Iredell soils. The Colfax soils are on small flats and at the head of drainageways. The Fluvaquents and the Forestdale and Worsham soils are along drainageways and streams. Also included, in spots, are soils that have a surface layer of clay loam, clay, or gravelly fine sandy loam.

Permeability is slow, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair. Natural fertility is moderate, and the content of organic matter is low. The subsoil is very plastic and has a high shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by the very firm clay in the subsoil. The surface layer and the subsoil are strongly acid to moderately alkaline unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Alfalfa is short-lived because of seasonal wetness and restricted root growth. Erosion is a major management problem. The low content of organic matter, the acidity, and the moderate natural fertility are also problems. Artificial drainage is needed.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

This complex is suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness.

These soils are limited for urban uses and for use as septic tank absorption fields mainly because of the slow permeability and high shrink-swell potential of the subsoil and a seasonal high water table. They are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

49B—Orangeburg fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on broad, slightly convex ridgetops on the Coastal Plain. The slopes are smooth, commonly complex, and about 200 to 800 feet long. Areas are irregularly rectangular or elongated. They range in size from about 4 acres to more than 20 acres.

Typically, the surface layer is dark grayish brown and light yellowish brown fine sandy loam about 16 inches thick. The subsoil to a depth of about 70 inches is mainly brown, yellowish red, and red, friable, plastic sandy clay loam.

Included in mapping are small areas of moderately well drained Bourne, Dogue, and Goldsboro soils and well drained Faceville, Kempsville, Kenansville, Norfolk, Suffolk, and Varina soils. The Bourne, Dogue, and Goldsboro soils are on small flats and along small drainageways. The Faceville, Kempsville, Kenansville, Norfolk, Suffolk, and Varina soils are scattered throughout the mapped areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic, but it has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, the bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and some acreage is wooded. The trees are mainly pine and hardwoods. The potential productivity is high.

This soil has only slight limitations for urban uses and for use as septic tank absorption fields. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

50A—Orangeburg-Faceville fine sandy loams, 0 to 2 percent slopes. This complex consists of nearly level, well drained soils on broad ridgetops on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and about 400 to 1,600 feet wide. They range in size from 4 acres to more than 50 acres.

This complex is about 55 percent Orangeburg soil and 35 percent Faceville soil. Included soils make up the rest.

Typically, the surface layer of the Orangeburg soil is dark grayish brown and light yellowish brown fine sandy loam about 16 inches thick. The subsoil to a depth of about 70 inches is mostly brown, yellowish red, and red, friable, plastic sandy clay loam. The surface layer of the Faceville soil is yellowish brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 70 inches is mostly yellowish red and red, friable, plastic clay loam and clay.

Included in mapping are small areas of moderately well drained Atlee, Bourne, Dogue, Duplin, and Goldsboro soils; poorly drained Coxville soils; somewhat poorly drained Dunbar soils; and well drained Kempsville, Norfolk, and Suffolk soils. The Atlee, Bourne, Dogue, Duplin, Coxville, and Dunbar soils are in slightly concave areas. The Goldsboro soils are along small drainageways. The Kempsville, Norfolk, and Suffolk soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of gravelly fine sandy loam.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic, but it has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, the bedrock does not generally limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

The soils in this complex are suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high to high.

The soils in this complex have only slight limitations for urban uses and for use as septic tank absorption fields. They are a fair to good source of subgrade material for local roads and streets.

This complex is in capability class I.

50B—Orangeburg-Faceville fine sandy loams, 2 to 7 percent slopes. This complex consists of gently sloping, well drained soils on broad, slightly convex ridgetops

on the Coastal Plain. Slopes are smooth and complex and about 400 to 1,000 feet long. Areas are irregularly rectangular or irregularly oval and range in size from 4 acres to more than 100 acres.

This complex is about 55 percent Orangeburg soil and about 35 percent Faceville soil. Included soils make up the rest.

Typically, the surface layer of the Orangeburg soil is dark grayish brown and light yellowish brown fine sandy loam about 16 inches thick. The subsoil to a depth of about 70 inches is mostly brown, yellowish red, and red, friable, plastic sandy clay loam. The surface layer of the Faceville soil is yellowish brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 70 inches is mostly yellowish red and red, friable, plastic clay loam and clay.

Included in mapping west of the Fall Line are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Creedmoor soils; and well drained Appling, Cecil, Mayodan, Pacolet, Spotsylvania, Vance, and Wedowee soils. The Abell, Bourne, and Creedmoor soils are at the head of drainageways and along drainageways. The Appling, Cecil, Mayodan, Pacolet, Spotsylvania, Vance, and Wedowee soils are scattered throughout the mapped areas. Included in mapping east of the Fall Line are small areas of moderately well drained Atlee, Bourne, Dogue, Duplin, and Goldsboro soils; poorly drained Coxville soils; somewhat poorly drained Dunbar soils; and well drained Caroline, Kempsville, Norfolk, and Suffolk soils. The Atlee, Dogue, Duplin, Coxville, and Dunbar soils are on small flats and in slightly concave areas. The Bourne, Caroline, Kempsville, Norfolk, and Suffolk soils are scattered throughout the mapped areas. The Goldsboro soils are mainly along small drainageways. Also included, in spots, are soils that have a surface layer of gravelly fine sandy loam.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic but has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertility is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high to high.

These soils have only slight limitations for urban uses and for use as septic tank absorption fields. They are a fair to good source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

50C—Orangeburg-Faceville fine sandy loams, 7 to 15 percent slopes. This complex consists of sloping, well drained soils on somewhat broad, slightly convex side slopes on the Coastal Plain. Slopes are smooth and complex and about 200 to 800 feet wide. Areas are irregularly rectangular or irregularly oval and range in size from 4 acres to more than 20 acres.

This complex is about 40 percent Orangeburg soil and about 35 percent Faceville soil. Included soils make up the rest.

Typically, the surface layer of the Orangeburg soil is dark grayish brown and light yellowish brown fine sandy loam about 16 inches thick. The subsoil to a depth of about 70 inches is mostly brown, yellowish red, and red, friable, plastic sandy clay loam. The surface layer of the Faceville soil is yellowish brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 70 inches is mostly yellowish red and red, friable, plastic clay loam and clay.

Included in mapping are small areas of well drained Caroline, Kempsville, and Norfolk soils; moderately well drained Bourne and Goldsboro soils; and poorly drained Fluvaquents. The Caroline, Kempsville, Norfolk, and Bourne soils are scattered throughout the mapped areas. The Goldsboro soils and the Fluvaquents are along small drainageways and streams. Also included, in spots, are soils that have a surface layer of gravelly fine sandy loam or sandy clay loam.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic but has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Erosion is a

major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high to high.

These soils are limited for many urban uses and for use as septic tank absorption fields because of slope. They are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

51B2—Pacolet fine sandy loam, 2 to 7 percent slopes, eroded. This is a gently sloping, well drained soil on narrow, convex ridgetops on the Piedmont. Slopes are smooth, commonly complex, and about 80 to 200 feet long. Areas are elongated or long and winding. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark yellowish brown and strong brown fine sandy loam about 5 inches thick. The subsoil is about 30 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne soils; somewhat poorly drained to moderately well drained Iredell and Orange soils; and well drained Appling, Cullen, Spotsylvania, and Vance soils. The Abell soils are in saddles and along small drainageways. The Bourne, Appling, Cullen, Spotsylvania, and Vance soils are scattered throughout the mapped areas. The Iredell and Orange soils are around the head of drainageways and on small flats. Also included, in spots, are soils that have a surface layer of gravelly sandy loam or clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil has slight to moderate limitations for urban uses. It is limited for use as septic tank absorption fields because of its moderate permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

51C2—Pacolet fine sandy loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and narrow, convex side slopes on the Piedmont. Slopes are smooth, commonly complex, and about 80 to 300 feet long. Areas are elongated or long and winding. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark yellowish brown and strong brown fine sandy loam about 5 inches thick. The subsoil is about 30 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Cullen, Spotsylvania, Vance, and Varina soils; moderately well drained Bourne and Helena soils; somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are mainly along small drainageways. The Appling, Bourne, Cullen, Spotsylvania, Vance, and Varina soils are mainly on the ridges and the upper part of side slopes. The Colfax, Helena, Iredell, and Orange soils are at the head of drainageways. The Fluvaquents and the Worsham soils are along drainageways and small streams. Also included, in spots, are soils that have a surface layer of

gravelly sandy loam or clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, and natural fertility and the content of organic matter are low. The subsoil is plastic but has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly aicd unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for many urban uses because of slope. It is limited for use as septic tank absorption fields by slope and the moderate permeability. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

51D2—Pacolet fine sandy loam, 15 to 25 percent slopes, eroded. This is a moderately steep, well drained soil on slightly convex side slopes along drainageways on the Piedmont. Slopes are smooth, commonly complex, and about 180 to 300 feet long. Areas are elongated or long and winding. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark yellowish brown and strong brown fine sandy loam about 5 inches thick. The subsoil is about 30 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam.

Included in mapping are small areas of well drained to excessively drained Ashlar soils, poorly drained Fluvaquents, and well drained Spotsylvania soils. The Ashlar soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways and small streams. The Spotsylvania soils are mostly on the upper part of side slopes. Rock outcrop or soils that have a surface layer of gravelly sandy loam or clay loam are included in spots. The included soils and the Rock outcrop make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic but has low shrink-swell potential. The root zone extends to a depth of 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is generally deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. The soil is somewhat droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

This soil is limited for many urban uses and for use as septic tank absorption fields because of slope. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

52C3—Pacolet clay loam, 7 to 15 percent slopes, severely eroded. This is a sloping, well drained soil on narrow, convex ridgetops and slightly convex side slopes on the Piedmont. Slopes are smooth, commonly complex, and about 80 to 300 feet long. Areas are elongated or long and narrow. They range in size from 5 acres to more than 20 acres.

Typically, the surface layer is yellowish red clay loam about 5 inches thick. The subsoil is about 25 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils, somewhat poorly

drained to moderately well drained Colfax soils, poorly drained Fluvaquents, moderately well drained Helena soils, and well drained Cullen and Vance soils. The Abell soils are at the head of small drainageways. The Colfax soils are at the head of drainageways and along drainageways. The Fluvaquents are along drainageways. The Helena soils are mainly on the upper part of side slopes. The Cullen and Vance soils are mainly on narrow ridges. Also included, in spots, are soils that have a surface layer of gravelly sandy loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic but has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. The soil is droughty during the growing season. Erosion is a major management problem. Acidity and low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Crop residue should be kept on the surface. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderate. Seedling mortality is a moderate hazard. The use of equipment generally needed in woodland management or harvesting is moderately limited by the clay loam surface layer, and the hazard of erosion from the use of this equipment is moderate.

This soil is limited for many urban uses. It is limited for use as septic tank absorption fields by the moderate permeability. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

53B—Pacolet-Cecil gravelly sandy loams, 2 to 7 percent slopes. This complex consists of gently sloping, well drained soils on narrow, convex ridgetops on the Piedmont. Slopes are smooth and complex and are 80 to 250 feet long. Areas are elongated and 5 to 20 acres in size.

This complex is about 45 percent Pacolet soil and 40 percent Cecil soil. Included soils make up the rest.

Typically, the surface layer of the Pacolet soil is dark yellowish brown and strong brown gravelly sandy loam about 8 inches thick. The subsoil is about 25 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam. The surface layer of the Cecil soil is yellowish brown and brown gravelly sandy loam about 8 inches thick. The subsoil is about 48 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 63 inches is red clay loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils; well drained Cullen, Spotsylvania, and Vance soils; and somewhat poorly drained to moderately well drained Iredell and Orange soils. The Abell soils are in saddles and at the head of small drainageways. The Cullen, Spotsylvania, and Vance soils are mainly on the crest of ridges. The Iredell and Orange soils are at the head of drainageways and on small flats. Also included, in spots, are soils that have a surface layer of gravelly clay loam.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil is plastic, and in the Cecil soil it has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, the soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. The pebbles in the surface layer interfere somewhat with tillage and planting and damage farm equipment.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

These soils are limited for urban uses and for use as septic tank absorption fields because of the moderate permeability. Moderate shrink-swell potential is an additional limitation to urban uses on the Cecil soil. The Pacolet and Cecil soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

53C2—Pacolet-Cecil gravelly sandy loams, 7 to 15 percent slopes, eroded. This complex consists of sloping, well drained soils on narrow, convex ridgetops and narrow, slightly convex side slopes on the Piedmont. Slopes are smooth and complex and 150 to 300 feet long. Areas are elongated and 5 to 20 acres in size.

This complex is about 55 percent Pacolet soil and about 35 percent Cecil soil. Included soils make up the rest.

Typically, the surface layer of the Pacolet soil is dark yellowish brown and strong brown gravelly sandy loam about 5 inches thick. The subsoil is about 25 inches thick. It is mostly red, friable to firm, plastic clay loam and clay. The substratum to a depth of about 60 inches is yellowish red and reddish yellow loam. The surface layer of the Cecil soil is yellowish brown and brown gravelly sandy loam about 5 inches thick. The subsoil is about 48 inches thick. It is mostly red, firm, plastic clay. The substratum to a depth of about 60 inches is red clay loam.

Included in mapping are small areas of well drained Cullen and Spotsylvania soils and poorly drained Fluvaquents. The Cullen and Spotsylvania soils are mainly on ridges and the upper part of side slopes. The Fluvaquents are along drainageways. Also included, in spots, are soils that have a surface layer of gravelly clay loam.

Permeability is moderate, and the available water capacity is medium. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but there are enough pebbles in the surface layer to dull and damage plowshares. Natural fertility and the content of organic matter are low. The subsoil is plastic, and in the Cecil soil it has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Pebbles in the surface layer interfere somewhat with tillage and planting and damage farm equipment.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

These soils are limited for urban uses and for use as septic tank absorption fields because of the moderate permeability and slope. The moderate shrink-swell potential is an additional limitation to urban uses on the Cecil soil. The Pacolet and Cecil soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

54B—Pamunkey loamy sand, 2 to 7 percent slopes. This is a gently sloping, well drained soil on broad, slightly convex terraces along the larger streams on the Piedmont and the Coastal Plain. Slopes are smooth and 200 to more than 1,000 feet wide. Areas are commonly elongated or irregularly rectangular. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark brown loamy sand about 9 inches thick. The subsoil is about 37 inches thick. It is mostly yellowish red, friable, slightly plastic sandy clay loam and clay loam. The substratum to a depth of about 99 inches is yellowish brown, strong brown, and reddish brown sand and gravel.

Included in mapping are small areas of moderately well drained Altavista and Kenansville Variant soils, somewhat poorly drained Augusta soils, and excessively drained Tarboro soils. The Altavista, Kenansville Variant, and Augusta soils are mainly at the head of drainageways, along drainageways, and in slightly concave areas. The Tarboro soils are scattered throughout the mapped areas. Also included, in spots, are soils that have a surface layer of gravelly sandy loam and gravelly loamy sand. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, and natural fertility and the content of organic matter are moderate. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly neutral to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The moderate content of organic matter, the acidity, and the moderate natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is only slightly limited for many urban uses. It is slightly limited for use as septic tank absorption fields; however, there is some hazard of ground water pollution. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

55A—Pamunkey fine sandy loam, 0 to 2 percent slopes. This is a nearly level, well drained soil on broad terraces along the larger streams on the Piedmont and the Coastal Plain. Areas are commonly elongated or irregularly rectangular. They are 200 to more than 1,000 feet wide and range from 5 acres to more than 50 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 9 inches thick. The subsoil is about 37 inches thick. It is mostly yellowish red, friable, slightly plastic sandy clay loam and clay loam. The substratum to a depth of about 99 inches is yellowish brown, strong brown, and reddish brown sand and gravel (fig. 4).

Included in mapping are small areas of moderately well drained Altavista and Goldsboro soils and somewhat poorly drained Augusta and Wahee soils. These soils are at the head of drainageways, along drainageways, and in slightly concave areas. Also included, in spots, are soils that have a surface layer of gravelly sandy loam, gravelly loamy sand, or loamy sand. These soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, and natural fertility and the content of organic matter are moderate. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly neutral to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is very well suited to cultivated crops and to pasture and hay. Most of the acreage of this soil is farmed. The moderate content of organic matter, the acidity, and the moderate natural fertility are management problems.

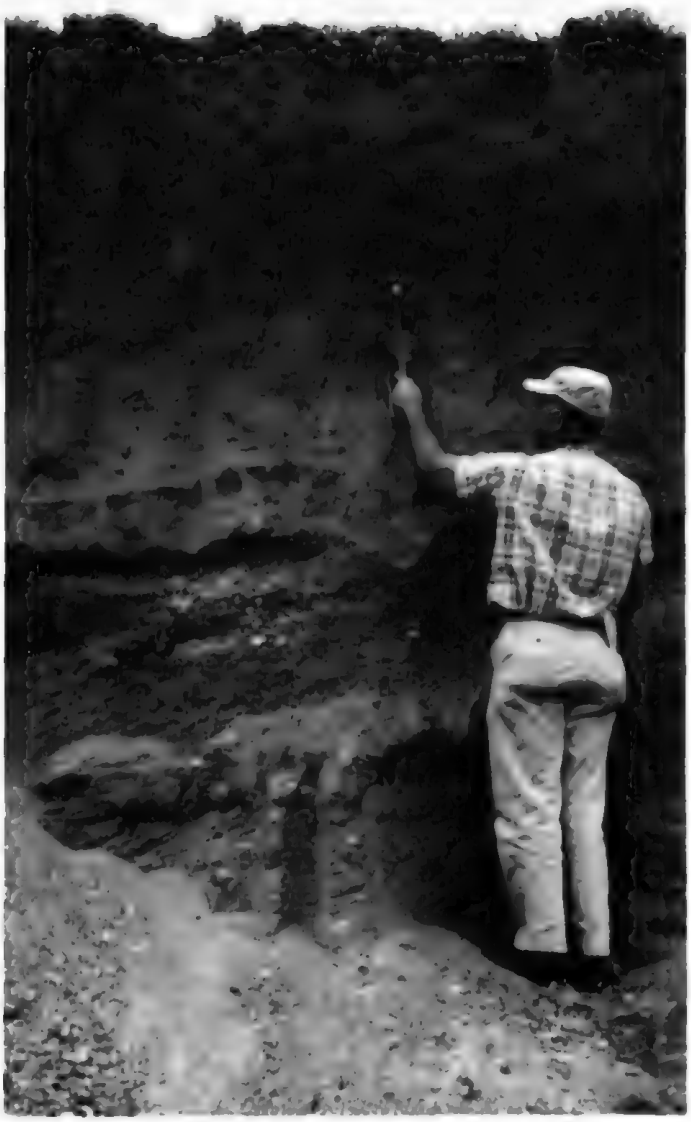


Figure 4.—This cut in Pamunkey fine sandy loam, 0 to 2 percent slopes, shows the solum and part of the substratum. This soil is deep and well drained and is good for most uses.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of

the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is only slightly limited for many uses. It is slightly limited for use as septic tank absorption fields; however, there is some hazard of ground water pollution. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability class I.

55B—Pamunkey fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to broad, slightly convex terraces along the larger streams on the Piedmont and the Coastal Plain. Slopes are smooth and about 200 to 1,200 feet long. Areas are commonly elongated or irregularly rectangular. They range in size from 5 acres to more than 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 9 inches thick. The subsoil is about 37 inches thick. It is mostly yellowish red, friable, slightly plastic sandy clay loam and clay loam. The substratum to a depth of about 99 inches is yellowish brown, strong brown, and reddish brown sand and gravel.

Included in mapping are small areas of moderately well drained Altavista and Goldsboro soils, somewhat poorly drained Augusta and Wahee soils, and poorly drained Fluvaquents. The Altavista, Goldsboro, Augusta, and Wahee soils are at the head of drainageways, along drainageways, and in slightly concave areas. The Fluvaquents are along drainageways and streams. Also included, in spots, are soils that have a surface layer of gravelly sandy loam, gravelly loamy sand, and loamy sand. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, and natural fertility and the content of organic matter are moderate. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly neutral to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The moderate content of organic matter, the acidity, and the moderate natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is only slightly limited for many urban uses. It is slightly limited for use as septic tank absorption fields; however, there is some hazard of ground water pollution. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

56—Pamunkey fine sandy loam, occasionally flooded. This is a nearly level, well drained soil on narrow to somewhat broad, low terraces along the larger streams on the Piedmont and the Coastal Plain. Areas are commonly elongated or irregularly rectangular. They are 200 to more than 600 feet wide and range from 5 to more than 50 acres in size.

Typically, the surface layer is dark brown fine sandy loam about 9 inches thick. The subsoil is about 37 inches thick. It is mostly yellowish red, friable, slightly plastic sandy clay loam and clay loam. The substratum to a depth of about 99 inches is yellowish brown, strong brown, and reddish brown sand and gravel.

Included in mapping are small areas of moderately well drained Altavista soils, somewhat poorly drained Augusta and Chewacla soils, and poorly drained Fluvaquents. The Altavista and Augusta soils are along small drainageways and in slightly concave areas. The Chewacla soils and the Fluvaquents are along large drainageways and streams. Also included, in spots, are soils that have a surface layer of gravelly sandy loam, gravelly loamy sand, or loamy sand. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, and natural fertility and the content of organic matter are moderate. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly neutral to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is occasionally flooded for brief periods in winter and spring.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage of this soil is farmed. The moderate content of organic matter, the acidity, and the moderate natural fertility are management problems. Flood control is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain

the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and moderate natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is limited for many urban uses because of flooding. It is limited for use as septic tank absorption fields. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIw.

57B—Pamunkey Variant gravelly sandy loam, 0 to 4 percent slopes. This is a nearly level to very gently sloping, somewhat excessively drained soil on broad terraces along the larger streams on the Piedmont and the Coastal Plain. Areas are commonly elongated. They are 200 to more than 1,000 feet wide and range from 5 acres to more than 50 acres in size.

Typically, the surface layer is dark brown gravelly sandy loam about 9 inches thick. The subsoil is about 32 inches thick. It is mostly reddish brown and yellowish red, friable, slightly plastic gravelly sandy loam and very gravelly sandy loam. The substratum to a depth of about 60 inches is strong brown and yellowish brown sand and gravel.

Included in mapping are small areas of moderately well drained Altavista soils, somewhat poorly drained Chewacla and Wahee soils, poorly drained Fluvaquents, moderately well drained to well drained Udifluvents, and excessively drained Tarboro soils. The Altavista and Wahee soils are at the head of drainageways, along drainageways, and in slightly concave areas. The Chewacla soils, Fluvaquents, and Udifluvents are along drainageways and streams. The Tarboro soils are along the edges of the mapped areas toward streams and in slightly higher areas throughout the mapped areas. Also included are spots of sand and gravel. The included soils make up about 15 percent of this map unit.

Permeability is moderately rapid, and the available water capacity is low. Runoff is slow. Erosion is a slight hazard. Tilth is fair. There are enough pebbles in the surface layer to dull and damage plowshares. The soil is low in natural fertility and in content of organic matter. The subsoil is slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly slightly acid to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. The soil is droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are management problems. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The potential productivity is high.

This soil is only slightly limited for many urban uses. It is slightly limited for use as septic tank absorption fields; however, there is some hazard of ground water pollution. This soil is a good source of fill for local roads and streets.

This map unit is in capability subclass IIIs.

58C—Pinkston-Mayodan sandy loams, 7 to 15 percent slopes. This complex consists of sloping, excessively drained and well drained soils on narrow, convex ridgetops and narrow, convex side slopes on the Piedmont. Slopes are smooth, commonly complex, and 100 to 500 feet long. Areas are elongated or long and winding. They are 5 to more than 75 acres in size.

This complex is about 35 percent Pinkston sandy loam and about 30 percent Mayodan sandy loam. Included soils make up the rest.

Typically, the surface layer of the Pinkston soil is dark grayish brown and yellowish brown sandy loam about 12 inches thick. The subsoil is about 20 inches thick. It is mostly yellowish brown, friable, slightly plastic sandy loam. Weathered sandstone is at a depth of about 32 inches. The surface layer of the Mayodan soil is very dark grayish brown and yellowish brown sandy loam about 8 inches thick. The subsoil is about 39 inches thick. It is mostly yellowish red, firm, plastic clay. The substratum to a depth of about 89 inches is yellowish red and strong brown sandy clay loam and clay loam.

Included in mapping are small areas of moderately well drained Creedmoor and Helena soils, somewhat poorly drained to moderately well drained Colfax soils, and well drained Edgehill Variant soils. The Creedmoor, Colfax, and Helena soils are mainly at the head of small drainageways and along drainageways. The Edgehill Variant soils are mainly on narrow ridges. Also included,

in spots, are soils that have a surface layer of gravelly sandy loam and gravelly sandy clay loam, soils that are underlain by bedrock at a depth of less than 20 inches, or rock outcrop.

Permeability is moderately rapid in the Pinkston soil and moderate in the Mayodan soil. The available water capacity is low in the Pinkston soil and moderate in the Mayodan soil. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil of the Pinkston soil is slightly plastic and has a low shrink-swell potential. The subsoil of the Mayodan soil is plastic and has a low shrink-swell potential. The root zone of the Pinkston soil extends to a depth of about 32 inches. The root zone of the Mayodan soil extends to a depth of about 60 inches. The surface layer and the subsoil of these soils are strongly acid to extremely acid unless lime has been applied. In most places, the Mayodan soil is deep to bedrock. The Pinkston soil is underlain by bedrock at a depth of about 20 to 40 inches.

The soils in this complex are poorly suited to cultivated crops. They are better suited to close-growing crops and to pasture and hay. The Pinkston soil is droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is slight to severe. The potential productivity is moderate to moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope. There is a slight to moderate hazard of erosion from the use of this equipment. Windthrow is a slight to moderate hazard.

The soils in this complex are limited for many urban uses and for use as septic tank absorption fields by slope. The shallowness to bedrock is an additional limitation to these uses on the Pinkston soil. The Pinkston and Mayodan soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IVe.

58D—Pinkston-Mayodan sandy loams, 15 to 25 percent slopes. This complex consists of moderately steep, excessively drained and well drained soils on narrow to somewhat broad, convex side slopes on the Piedmont. Slopes are smooth to irregular, commonly complex, and 150 to 600 feet long. Areas are elongated or long and winding. They are 5 to more than 100 acres in size.

This complex is about 50 percent Pinkston soil and 35 percent Mayodan soil. Included soils make up the rest.

Typically, the surface layer of the Pinkston soil is dark grayish brown and yellowish brown sandy loam about 12 inches thick. The subsoil is about 20 inches thick. It is mostly yellowish brown, friable, slightly plastic sandy loam. Weathered sandstone is at a depth of about 32 inches. The surface layer of the Mayodan soil is very dark grayish brown and yellowish brown sandy loam about 8 inches thick. The subsoil is about 39 inches thick. It is mostly yellowish red, firm, plastic clay. The substratum to a depth of about 89 inches is yellowish red and strong brown sandy clay loam and clay loam.

Included in mapping are small areas of somewhat poorly drained Chewacla soils, poorly drained Fluvaquents, and moderately well drained to well drained Udifluvents. These soils are along drainageways and streams. Also included, in spots, are soils that have a surface layer of gravelly sandy loam and gravelly sandy clay loam, soils that are underlain by bedrock at a depth of less than 20 inches, or rock outcrop.

Permeability is moderately rapid in the Pinkston soil and moderate in the Mayodan soil. The available water capacity is low in the Pinkston soil and moderate in the Mayodan soil. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic to plastic and has a low shrink-swell potential. The root zone of the Pinkston soil extends to a depth of about 32 inches. The root zone of the Mayodan soil extends to a depth of about 60 inches. The surface layer and the subsoil of these soils are strongly acid to very strongly acid unless lime has been applied. In most places, the Mayodan soil is deep to bedrock. The Pinkston soil is underlain by bedrock at a depth of about 20 to 40 inches.

The soils in this complex are not suited to cultivated crops, but they are suited to pasture and hay. Erosion is a major management problem. The soils are droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hard-

woods, for which the hazard of seedling mortality is moderate to severe. The potential productivity is moderate to moderately high. The use of equipment generally needed in woodland management or harvesting is moderately to severely limited by slope. The hazard of erosion from the use of this equipment is moderate to severe. Windthrow is a slight to moderate hazard.

These soils are limited for urban uses and for use as septic tank absorption fields by slope. Shallowness to bedrock is an additional limitation to these uses on the Pinkston soil. The Pinkston and Mayodan soils are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass VIe.

58E—Pinkston-Mayodan sandy loams, 25 to 45 percent slopes. This complex consists of steep, excessively drained and well drained soils on narrow to somewhat broad, convex side slopes on the Piedmont. Slopes are irregular, commonly complex, and 150 to 800 feet long. Areas are along drainageways and small streams and are elongate or long and winding. They are 5 to more than 100 acres in size.

This complex is about 50 percent Pinkston soil and about 30 percent Mayodan soil. Included soils make up the rest.

Typically, the surface layer of the Pinkston soil is dark grayish brown and yellowish brown sandy loam about 12 inches thick. The subsoil is about 20 inches thick. It is mostly yellowish brown, friable, slightly plastic sandy loam. Weathered sandstone is at a depth of about 32 inches. The surface layer of the Mayodan soil is very dark grayish brown and yellowish brown sandy loam about 8 inches thick. The subsoil is about 39 inches thick. It is mostly yellowish red, firm, plastic clay. The substratum to a depth of about 89 inches is yellowish red and strong brown sandy clay loam and clay loam.

Included in mapping are small areas of somewhat poorly drained Chewacla soils, poorly drained Fluvaquents, and moderately well drained to well drained Udifluvents. These soils are along drainageways and streams. Also included, in spots, are soils that have a surface layer of gravelly sandy loam and gravelly sandy clay loam, soils that are underlain by bedrock at a depth of less than 20 inches, or rock outcrop.

Permeability is moderately rapid in the Pinkston soil and moderate in the Mayodan soil. The available water capacity is low in the Pinkston soil and moderate in the Mayodan soil. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil of the Pinkston soil is slightly plastic and has a low shrink-swell potential, and the subsoil of the Mayodan soil is plastic and has a low shrink-swell potential. The root zone of the Pinkston soil extends to a depth of about 32 inches. The root zone of the Mayodan soil extends to a depth of about 60 inches. The surface layer and the subsoil of these soils are strongly acid to very strongly acid unless lime has been applied. In most places, the Mayodan soil is deep to bedrock. The Pinkston soil is underlain by bedrock at a depth of about 20 to 40 inches.

The soils in this complex are not suited to cultivated crops, close-growing crops, or hay. They are poorly suited to pasture. Erosion is a major management problem. The soils are droughty during the growing season.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, and deferred grazing can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is severe. The potential productivity is moderate to moderately high. The use of equipment generally needed in woodland management or harvesting is severely limited by slope. The hazard of erosion from the use of this equipment is severe. Windthrow is a moderate hazard.

These soils are limited for many urban uses by slope. Shallowness to bedrock is an additional limitation to these uses on the Pinkston soil. The Pinkston and Mayodan soils are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass VIIe.

59—Pits, borrow. This map unit consists of open excavations from which soil, gravel, or other material has been removed for use as fill or as subgrade material for roads and streets or for other construction uses. Most pits are on the Coastal Plain.

Borrow pits commonly extend into the geologic formations under the soil. These geologic formations and the waste material in and around the pits are quite variable in physical and chemical properties. The reclamation of borrow pits commonly depends on thorough onsite investigation.

This miscellaneous area is not assigned to a capability subclass.

60—Pits, quarry. This map unit consists of open excavations from which rock, feldspar, and mica have been removed for use as construction material or industrial raw material. These pits are on the Piedmont. Included in the mapped areas are spoil, settling basins, machinery, stockpiles, and buildings associated with mining and quarrying operations.

Quarry pits commonly extend into the geologic formations under the soil. These geologic formations and the waste material left in and around the pits are quite variable in physical and chemical properties. The reclamation of quarry pits commonly depends on thorough onsite investigation.

This miscellaneous area is not assigned to a capability subclass.

61—Rains fine sandy loam. This is a nearly level, poorly drained soil on narrow to somewhat broad, low-lying areas along drainageways on the Coastal Plain. Areas are irregularly rectangular or elongated, commonly slightly concave, and about 200 feet to 2,000 feet wide. They range in size from 5 acres to more than 20 acres.

Typically, the surface layer is very dark grayish brown and olive gray fine sandy loam about 17 inches thick. The subsoil is about 51 inches thick. It is mostly gray, friable, slightly plastic sandy clay loam that is commonly mottled in brighter colors. The substratum to a depth of about 80 inches is gray sand and clay.

Included in mapping are small areas of somewhat poorly drained Dunbar soils, moderately well drained Duplin and Goldsboro soils, and well drained Suffolk soils. These soils are slightly higher on the landscape than the Rains soil; they are along the edges of the mapped areas, toward the uplands. Also included, in spots, are very poorly drained soils or ponded soils. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is fair, but the soil is wet during winter and spring. The soil is low in natural fertility and moderate in content of organic matter. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat restricted by wetness below a depth of about 50 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops and moderately well suited to pasture and hay. Alfalfa is short-lived because of seasonal wetness. Acidity and low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and much of the acreage is wooded. The trees are pine and hardwoods, for which the hazard of seedling mortality is severe. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is severely limited by seasonal wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVw.

62B—Spotsylvania-Bourne fine sandy loams, 2 to 7 percent slopes. This complex consists of gently sloping, well drained and moderately well drained soils on narrow to somewhat broad, convex ridgetops on the eastern edge of the Piedmont. Slopes are smooth, commonly complex, and about 100 to 300 feet long. Areas are elongated or long and winding. They are about 5 acres to more than 50 acres in size.

This complex is about 35 percent well drained Spotsylvania soil and about 30 percent moderately well drained Bourne soil. Included soils make up the rest.

Typically, the surface layer of the Spotsylvania soil is dark grayish brown and light yellowish brown fine sandy loam about 12 inches thick. The subsoil to a depth of about 60 inches is mostly yellowish brown, strong brown, and yellowish red sandy clay loam and clay. The surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil in the upper part is mostly yellowish brown sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan is light yellowish brown and gray, brittle and compact sandy loam. The substratum is white clay.

Included in mapping are small areas of moderately well drained to well drained Abell soils and well drained Appling, Cecil, Faceville, Masada, Norfolk, Orangeburg, Pacolet, Vance, Varina, and Wedowee soils. The Abell soils are in saddles and along small drainageways. The other soils are scattered throughout the mapped areas.

Permeability is moderate to very slow. The available water capacity is moderate to low. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil has a low shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless limed. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are well suited to cultivated crops and to pasture. They are also well suited to hay; however, alfalfa is short-lived because of seasonal wetness and restricted root growth. The soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce

the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees. The trees are pine and hardwoods. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is slightly to moderately limited by seasonal wetness.

These soils are limited for many urban uses and for use as septic tank absorption fields mainly because of the moderate to very slow permeability and a seasonal high water table. They are limited for use as sites for houses and other small structures. They are a poor to fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

62C—Spotsylvania-Bourne fine sandy loams, 7 to 15 percent slopes. This complex consists of sloping, well drained and moderately well drained soils on narrow to somewhat broad, convex side slopes on the eastern edge of the Piedmont. Slopes are smooth, commonly complex and about 200 to 500 feet long. Areas follow the ridges and are elongated or long and winding. They are about 5 to more than 50 acres in size.

This complex is about 35 percent well drained Spotsylvania soil and about 30 percent moderately well drained Bourne soil. Included soils make up the rest.

Typically, the surface layer of the Spotsylvania soil is dark grayish brown and light yellowish brown fine sandy loam about 12 inches thick. The subsoil to a depth of about 60 inches is mostly yellowish brown, strong brown, and yellowish red sandy clay loam and clay. The surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil in the upper part is mostly yellowish brown sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. This fragipan consists of light yellowish brown and gray, brittle and compact sandy loam. The substratum is white clay.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Cecil, Pacolet, Vance, and Wedowee soils; and poorly drained Fluvaquents. The Abell soils are along small drainageways. The Appling, Cecil, Pacolet, Vance, and Wedowee soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways and streams. Also included, in spots, are soils that have a surface layer of sandy clay loam, or rock outcrop.

Permeability is moderate to very slow. The available water capacity is moderate to low. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil has a low shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless limed. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture. They are also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness and restricted root growth. These soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is slightly to moderately limited by seasonal wetness.

These soils are limited for many urban uses and for use as septic tank absorption fields mainly because of the moderate to very slow permeability and a seasonal high water table. These soils are also limited for use as sites for houses and other small structures. They are a poor to fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIIe.

63A—Suffolk loamy fine sand, 0 to 2 percent slopes. This is a nearly level, well drained soil on broad ridgetops on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and about 200 to more than 1,200 feet wide. They range in size from 5 acres to more than 50 acres.

Typically, the surface layer is dark grayish brown and yellowish brown loamy fine sand and sandy loam about 14 inches thick. The subsoil is about 22 inches thick. It is

mostly strong brown, friable, slightly plastic sandy clay loam. The substratum to a depth of about 72 inches is yellowish brown and strong brown sandy loam.

Included in mapping are small areas of moderately well drained Bourne, Dogue, and Goldsboro soils and well drained Caroline, Faceville, Kempsville, Kenansville, Norfolk, and Orangeburg soils. The Bourne, Caroline, Faceville, Kempsville, Kenansville, Norfolk, and Orangeburg soils are scattered throughout the mapped areas. The Dogue and Goldsboro soils are along small drainageways and in slightly concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is very well suited to cultivated crops and to pasture and most of the acreage is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is only slightly limited for many urban uses and for use as septic tank absorption fields. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability class I.

63B—Suffolk loamy fine sand, 2 to 7 percent slopes. This is a gently sloping, well drained soil on broad, slightly convex ridgetops on the Coastal Plain. Areas are irregularly rectangular or irregularly oval and about 200 to 1,200 feet long. They range in size from 5 to more than 30 acres.

Typically, the surface layer is dark grayish brown and yellowish brown loamy fine sand and sandy loam about 14 inches thick. The subsoil is about 22 inches thick. It is mostly strong brown, friable, slightly plastic sandy clay loam. The substratum to a depth of about 72 inches is yellowish brown and strong brown sandy loam.

Included in mapping are small areas of moderately well drained Bourne, Dogue, and Goldsboro soils and well drained Caroline, Faceville, Kempsville, Kenansville, Norfolk, and Orangeburg soils. The Bourne, Caroline, Faceville, Kempsville, Kenansville, Norfolk, and Orangeburg soils are scattered throughout the mapped areas. The Dogue and Goldsboro soils are along small drainageways and in slightly concave areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and feritlizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is only slightly limited for many urban uses and for use as septic tank absorption fields. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

63C—Suffolk loamy fine sand, 7 to 15 percent slopes. This is a sloping, well drained soil on narrow to somewhat broad side slopes on the Coastal Plain. Slopes are smooth and about 200 to 600 feet long. Areas are elongated. They range in size from about 50 acres to more than 150 acres.

Typically, the surface layer is dark grayish brown and yellowish brown loamy fine sand and sandy loam about 14 inches thick. The subsoil is about 22 inches thick. It is mostly strong brown, friable, slightly plastic sandy clay loam. The substratum to a depth of about 72 inches is yellowish brown and strong brown sandy loam.

Included in mapping are small areas of moderately well drained Bourne soils; well drained Faceville, Kempsville, Norfolk, and Orangeburg soils; and poorly drained Fluvaquents. The Bourne, Faceville, Kempsville, Norfolk, and Orangeburg soils are scattered throughout the mapped areas. The Fluvaquents are along drainageways. The included soils make up about 10 to 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, but only a small acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

This soil is limited for many urban uses and for use as septic tank absorption fields because of slope. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

64B—Tarboro loamy sand, 2 to 7 percent slopes. This is a gently sloping, somewhat excessively drained soil on narrow to broad terraces along the larger streams on the Piedmont and the Coastal Plain. Slopes are smooth and about 100 to 1,000 feet long. Areas are commonly elongated or irregularly rectangular and range in size from 4 acres to more than 60 acres.

Typically, the surface layer is dark brown loamy sand about 12 inches thick. The substratum to a depth of about 94 inches is reddish brown, brown, and strong brown, loose, nonplastic loamy sand that is gravelly below a depth of about 58 inches.

Included in mapping are small areas of moderately well drained Altavista soils, somewhat poorly drained Chewacla soils, poorly drained Fluvaquents, poorly drained Forestdale and Wehadkee soils, and well drained Pamunkey soils. The Altavista soils are along drainageways and in slightly concave areas. The Fluvaquents and the Chewacla, Forestdale, and Wehadkee soils are along drainageways and streams. The Pamunkey soils are scattered throughout the mapped areas. The included soils make up about 10 to 15 percent of this map unit.

Permeability is rapid, and the available water capacity is low. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The substratum is nonplastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the substratum are commonly strongly acid to medium acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Most of the acreage is farmed. This soil is droughty during the growing season. The low content of organic matter, the acidity, and the low natural fertility are management problems. Erosion is a minor problem.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced.

This soil is suited to trees, and potential productivity is moderately high. The trees are pine and hardwoods, for which the hazard of seedling mortality is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited because the soil is soft and loose.

This soil has slight limitations for many urban uses. It has slight limitations for use as septic tank absorption fields; however, there is some hazard of ground water pollution. It is a good source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIs.

65B—Turbeville fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex high stream terraces. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 10 acres to more than 30 acres.

Typically, the surface layer is dark grayish brown and yellowish brown fine sandy loam about 10 inches thick. The subsoil to a depth of about 88 inches is mostly dark red, friable, plastic clay loam and clay.

Included in mapping are small areas of moderately well drained Altavista soils and well drained Faceville, Masada, and Norfolk soils. The Altavista soils are mainly along small drainageways. The Faceville, Masada, and Norfolk soils are scattered throughout the mapped areas. Also included, in spots, are gravelly soils or soils that have a surface layer of yellowish red and red clay loam. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and some of the acreage is wooded. Most of the trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability, low strength, and moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

66C—Udalfs-Ochrepts complex, sloping. This complex consists of well drained to excessively drained soils. These soils are on narrow, convex ridgetops and on narrow to somewhat broad, convex side slopes on the Piedmont. Slopes are smooth and complex and are about 100 to 600 feet long. Areas follow the ridges and in many places are long and winding. They are 5 to more than 50 acres in size.

This complex is about 55 percent Udalfs and about 35 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer is about 5 to 12 inches thick. It consists of grayish brown to brown fine sandy loam, sandy loam, loam, silt loam, and clay loam. The subsoil is 10 to 40 inches thick. It consists of yellowish brown to red, friable to firm, slightly plastic to plastic fine sandy loam, sandy loam, loam, clay loam, and clay. The substratum is 10 to more than 30 inches thick. It consists of yellowish brown to red sandy loam, loam, and clay loam. In some areas the surface layer, the subsoil, and the substratum are gravelly or very gravelly. Bedrock is generally at a depth of 2 to 5 feet or more.

Included in mapping are small areas of moderately well drained to well drained Abell soils and well drained Appling, Pacolet, and Wedowee soils. The Abell soils are along small drainageways. The Appling, Pacolet, and Wedowee soils are mainly on the upper part of side slopes.

Permeability ranges from moderately rapid to moderately slow. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are very strongly acid to mildly alkaline.

The soils in this complex are poorly suited to cultivated crops. They are better suited to close-growing crops and to pasture and hay. These soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderate.

Some of the soils in this complex are limited for urban uses because of restricted permeability or the depth to bedrock. The soils in this complex are limited for use as septic tank absorption fields and for use as sites for houses and other small structures. These soils are a fair

to poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

66D—Udalfs-Ochrepts complex, moderately steep. This complex consists of well drained to excessively drained soils. These soils are on narrow to somewhat broad convex side slopes on the Piedmont. Slopes are smooth and complex and are about 100 to 800 feet long. Areas follow the ridges and in many places are long and winding. They are 5 to more than 50 acres in size.

This complex is about 55 percent Udalfs and 35 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer is about 5 to 12 inches thick. It consists of grayish brown to brown fine sandy loam, sandy loam, loam, silt loam, and clay loam. The subsoil is 10 to 40 inches thick. It consists of yellowish brown to red, friable to firm, slightly plastic to plastic fine sandy loam, sandy loam, loam, clay loam, and clay. The substratum is 10 to more than 30 inches thick. It consists of yellowish brown to red sandy loam, loam, and clay loam. In some areas the surface layer, the subsoil, and the substratum are gravelly or very gravelly. Bedrock is generally at a depth of 2 to 5 feet or more.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Pacolet, and Wedowee soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are along small drainageways and on toe slopes. The Appling, Pacolet, and Wedowee soils are scattered throughout the mapped areas. The Fluvaquents and the Worsham soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is slightly plastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil range from very strongly acid to mildly alkaline.

The soils in this complex are not suited to cultivated crops, but they are moderately well suited to pasture and hay. They are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for many urban uses, for use as septic tank absorption fields, and for use as sites for houses and other small structures mainly by slope and depth to bedrock. They are a fair to poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

66F—Udalfs-Ochrepts complex, steep. This complex consists of well drained to excessively drained soils. These soils are on narrow to somewhat broad, convex side slopes along the larger drainageways and streams on the Piedmont. Slopes are irregular and complex and are about 100 to 800 feet long. Areas follow the ridges and are, in many places, long and winding. They are 5 to more than 50 acres in size.

This complex is about 55 percent Udalfs and 35 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer is about 5 to 12 inches thick. It consists of grayish brown to brown fine sandy loam, sandy loam, loam, silt loam, and clay loam. The subsoil is 10 to 40 inches thick. It consists of yellowish brown to red, friable to firm, slightly plastic to plastic fine sandy loam, sandy loam, loam, clay loam, and clay. The substratum is 10 to more than 30 inches thick. It consists of yellowish brown to red sandy loam, loam, and clay loam. In some areas the surface layer, the subsoil, and the substratum are gravelly or very gravelly. Bedrock is generally at a depth of 2 to 5 feet or more.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Pacolet, and Wedowee soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are along small drainageways and on toe slopes. The Appling, Pacolet, and Wedowee soils are scattered throughout the mapped areas. The Fluvaquents and the Worsham soils are along drainageways and streams. Also included, on the lower part of the side slopes, are small areas of rock outcrop. The included soils and the rock outcrop make up about 10 percent of this complex.

Permeability ranges from moderately rapid to moderately slow. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil is slightly plastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil range from very strongly acid to mildly alkaline.

The soils in this complex are not suited to cultivated crops, and they are poorly suited to pasture. They are droughty during the growing season. Erosion is a major management problem.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, and deferred

grazing can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for most urban uses because of slope and depth to bedrock. They are a poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

67—Udifluvents, nearly level. This map unit consists of moderately well drained and well drained soils on narrow to somewhat broad flood plains on the Piedmont and the Coastal Plain. These soils formed in alluvium. Areas are commonly elongated or long and narrow. They are 5 to 20 acres in size.

Generally, the surface layer consists of gray to brown loam, sandy loam, loamy sand, or sand and is about 8 to 18 inches thick. The substratum to a depth of about 60 inches is commonly brown and dark brown to yellowish brown loam, sandy loam, sandy clay loam, silt loam, loamy sand, and sand. Some of these soils have gray mottles below a depth of about 20 inches. Some have thin layers of clay in the substratum.

Permeability is moderate to rapid, and the available water capacity is low to moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The substratum is commonly slightly plastic and has a low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the substratum are commonly medium acid to very strongly acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils. These soils are frequently flooded for long periods in winter and spring, and during heavy rains in summer and fall.

These soils are moderately well suited to cultivated crops and to pasture. They are also moderately well suited to hay; however, alfalfa is short-lived because of wetness and flooding. Much of the acreage of this map unit is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems. Flood control is needed.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

These soils are suited to trees, and some of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is very high. The use of equipment generally needed in woodland management or harvesting is moderately limited by wetness and flooding.

These soils are limited for most urban uses, for use as septic tank absorption fields, and for use as sites for houses and other small structures because of the flood hazard. They are a poor source of subgrade material for local roads and streets.

This map unit is not assigned to a capability subclass.

68—Udorthents, smoothed. This map unit consists of soil material that has been reworked by machinery. Most of the mapped areas consist of cuts and fills, including borrow pits and construction sites for industrial, commercial, governmental, and residential buildings and highways. Some fills are made up of old building materials, stumps, and other rubble and a variety of soil material.

Some of the cuts and excavations extend into the underlying sandy, loamy, and clayey sediments or bedrock and weathered bedrock.

Udorthents range from loamy sand to clay. Some are gravelly or very gravelly. Sediment production is medium to high in areas that do not have a vegetative cover.

Included in mapping are small areas of undisturbed soils that are commonly compacted and shaped to some extent but otherwise resemble the undisturbed soils surrounding areas of Udorthents.

Because these soils are so varied in properties and characteristics, onsite investigation is needed to determine potential for a particular use.

This map unit is not assigned to a capability subclass.

69C—Udults, sloping. These soils are moderately well drained to excessively drained. They are on narrow to somewhat broad, convex side slopes along drainageways and between uplands and terraces and on narrow side slopes between terraces and flood plains. Slopes are smooth and complex and about 200 to 800 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 50 acres.

Generally, the surface layer is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 12 inches to more than 40 inches thick. It consists of yellowish brown and pale brown to red sand and loamy sand to firm, plastic clay. The substratum ranges from sand to clay. Some of these soils have gray mottles, commonly below a depth of about 20 inches. In some of these soils, the surface layer, the subsoil, or the substratum, or all of these are gravelly or very gravelly.

Included in mapping are areas of poorly drained Fluvaquents and areas of moderately well drained Goldsboro soils. The Fluvaquents and the Goldsboro soils are along drainageways and streams. They make up about 5 percent of this map unit.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair to good, but natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

These soils are poorly suited to cultivated crops. They are better suited to close-growing crops and to pasture and hay. Some of the soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

These soils are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

These soils are limited for many urban uses, mainly because of variable permeability and slope. Variable permeability is also a limitation to the use of these soils as septic tank absorption fields. These soils are limited for use as sites for houses and other small structures. They are a good to poor source of subgrade material for local roads and streets.

This map unit is not assigned to a capability subclass.

69D—Udults, moderately steep. These soils are moderately well drained to excessively drained. They are on narrow to somewhat broad, convex side slopes along drainageways and between uplands and terraces and on narrow side slopes between terraces and flood plains. Slopes are smooth and complex and are about 200 to 1,200 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 50 acres.

Generally, the surface layer is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists of brown and pale brown to red sand and loamy sand to firm, plastic clay. The substratum ranges in texture from sand to clay. Some of these soils contain gray mottles, commonly below a depth of about 20 inches. In some of these soils the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are areas of poorly drained Fluvaquents and areas of moderately well drained Goldsboro soils. The Fluvaquents and the Goldsboro soils are along drainageways and streams. They make up about 5 percent of this map unit.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

These soils are not suited to cultivated crops. They are moderately well suited to pasture and hay. Some of the soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

These soils are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited because of slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for many uses and for use as septic tank absorption fields mainly because of slope. They are limited for use as sites for houses and other small structures. They are a good to poor source of subgrade material for local roads and streets.

This map unit is not assigned to a capability subclass.

70B—Udults-Ochrepts complex, gently sloping. This complex consists of moderately well drained to excessively drained soils. These soils are on narrow ridgetops and finger-shaped ridges on the Coastal Plain.

Slopes are smooth and complex and are about 120 to 300 feet long. Areas are elongated or long and winding. They range in size from about 5 to 20 acres.

This complex is about 50 percent Udults and 40 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer of the Udults is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists of yellowish brown and pale brown to red sand and loamy sand to firm plastic clay. Some Udults contain gray mottles, commonly below a depth of about 20 inches. The substratum consists of sand to clay. In some Udults the surface layer, the subsoil, the substratum, or all of these soils are gravelly or very gravelly.

Generally, the surface layer of the Ochrepts is about 6 to 18 inches thick. It consists of gray to brown sand and loamy sand to clay. The subsoil is 20 to 50 inches thick. It consists of gray to red sand to clay. The firmer, more plastic clay loam and clay subsoils commonly have gray mottles below a depth of about 24 inches. The substratum is commonly similar in color and texture to the subsoil. In some Ochrepts the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are small areas of poorly drained Fluvaquents and moderately well drained Goldsboro soils. These soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is medium. Erosion is a severe hazard. Tilth is fair to good, but natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. Some of the soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are well suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

These soils are limited for many urban uses and for use as septic tank absorption fields mainly because of variable permeability. They are limited for use as sites for houses and other small structures. They are a good to poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

70C—Udults-Ochrepts complex, sloping. This complex consists of moderately well drained to excessively drained soils. These soils are on narrow to somewhat broad, convex side slopes along drainageways, between uplands and terraces, and between terraces and flood plains. Slopes are smooth and complex and are about 200 to 1,000 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 100 acres.

This complex is about 55 percent Udults and 40 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer of the Udults is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists of yellowish brown and pale brown to red sand and loamy sand to firm plastic clay. Some Udults contain gray mottles, commonly below a depth of about 20 inches. The substratum ranges from sand to clay. In some Udults the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Generally, the surface layer of the Ochrepts is about 6 to 18 inches thick. It consists of gray to brown sand and loamy sand to clay. The subsoil is 20 to 50 inches thick. It consists of gray to red sand to clay. The firmer, more plastic clay loam and clay subsoils commonly have gray mottles below a depth of about 24 inches. The substratum is commonly similar in color and texture to the subsoil. In some Ochrepts the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are small areas of poorly drained Fluvaquents and moderately well drained Goldsboro soils. These soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair to good, but natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

The soils in this complex are poorly suited to cultivated crops. They are better suited to close-growing crops and

to pasture and hay. Some of the soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high.

These soils are limited for many urban uses and for use as septic tank absorption fields mainly because of variable permeability. They are limited for use as sites for houses and other small structures. They are a good to poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

70D—Udults-Ochrepts complex, moderately steep. This complex consists of moderately well drained to excessively drained soils. These soils are on narrow to somewhat broad, convex side slopes along drainageways, between uplands and terraces, and between terraces and flood plains. Slopes are smooth and complex and are about 200 to 1,000 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 100 acres.

This complex is about 55 percent Udults and 40 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer of the Udults is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists of yellowish brown and pale brown to red sand and loamy sand to firm, plastic clay. The substratum ranges from sand to clay. Some Udults contain gray mottles, commonly below a depth of about 20 inches. In some Udults the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Generally, the surface layer of the Ochrepts is about 6 to 18 inches thick. It consists of gray to brown sand and loamy sand to clay. The subsoil is 20 to 50 inches thick. It consists of gray to red sand to clay. The firmer, more plastic clay loam and clay subsoils commonly have gray mottles below a depth of about 24 inches. The substratum is commonly similar in color and texture to the subsoil. In some Ochrepts the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are small areas of poorly drained Fluvaquents and moderately well drained Goldsboro soils. These soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

The soils in this complex are not suited to cultivated crops. They are moderately well suited to pasture and hay. Some of the soils are droughty during the growing season. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for many urban uses and for use as septic tank absorption fields because of slope. They are limited for use as sites for houses and other small structures. They are a good to poor source of fill for local roads and streets.

This complex is not assigned to a capability subclass.

70E—Udults-Ochrepts complex, steep. This complex consists of moderately well drained to excessively drained soils. These soils are on narrow to somewhat broad, convex side slopes along drainageways and between uplands and terraces and on narrow side slopes between terraces and flood plains. Slopes are smooth and complex and are about 200 to 1,000 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 100 acres.

The complex is about 55 percent Udults and 40 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer of the Udults is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists

of yellowish brown and pale brown to red sand and loamy sand to firm plastic clay. The substratum ranges from sand to clay. Some Udults contain gray mottles, commonly below a depth of about 20 inches. In some Udults the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Generally, the surface layer of the Ochrepts is about 6 to 18 inches thick. It consists of gray to brown sand and loamy sand to clay. The subsoil is 20 to 50 inches thick. It consists of gray to red sand to clay. The firmer, more plastic clay loam and clay subsoils commonly have gray mottles below a depth of about 24 inches. The substratum is commonly similar in color and texture to the subsoil. In some Ochrepts the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are small areas of poorly drained Fluvaquents and moderately well drained Goldsboro soils. These soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

These soils are not suited to cultivated crops, and they have limited suitability for pasture. They are droughty during the growing season. Erosion is a major management problem.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, and deferred grazing can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

These soils are limited for most urban uses, for use as septic tank absorption fields, and for use as sites for houses and other small structures because of slope. They are a poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

70F—Udults-Ochrepts complex, very steep. This complex consists of moderately well drained to excessively drained soils. These soils are on narrow to somewhat broad, convex side slopes along drainageways and between uplands and terraces and on narrow side slopes between terraces and flood plains. Slopes are irregular and complex and are about 200 to 800 feet long. Areas are elongated or long and winding. They range in size from about 5 acres to more than 50 acres.

This complex is about 55 percent Udults and 40 percent Ochrepts. Included soils make up the rest.

Generally, the surface layer of the Udults is about 4 to 12 inches thick. It consists of gray to dark brown loamy fine sand and loamy sand to loam. The subsoil is less than 10 inches to more than 40 inches thick. It consists of yellowish brown and pale brown to red sand and loamy sand to firm plastic clay. The substratum ranges from sand to clay. Some Udults contain gray mottles, commonly below a depth of about 20 inches. In some Udults the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Generally, the surface layer of the Ochrepts is about 6 to 18 inches thick. It consists of gray to brown sand and loamy sand to clay. The subsoil is 20 to 50 inches thick. It consists of gray to red sand to clay. The firmer, more plastic clay loam and clay subsoils commonly have gray mottles below a depth of about 24 inches. The substratum is commonly similar in color and texture to the subsoil. In some Ochrepts the surface layer, the subsoil, the substratum, or all of these are gravelly or very gravelly.

Included in mapping are small areas of poorly drained Fluvaquents and moderately well drained Goldsboro soils. These soils are along drainageways and streams.

Permeability ranges from moderately rapid to moderately slow, and the available water capacity is low to moderate. Runoff is rapid. Erosion is a very severe hazard. Natural fertility and the content of organic matter are low. The subsoil is nonplastic to plastic and has a low to moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly strongly acid to extremely acid unless lime has been applied. In most places these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils. Seeps and springs are common at the lower edge of side slopes.

The soils in this complex are not suited to cultivated crops. They are poorly suited to pasture. They are droughty during the growing season. Erosion is a major management problem.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, and deferred grazing can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is severely limited by slope, and the hazard of erosion from the use of this equipment is severe.

These soils are not suited to most urban uses because of slope. They are a poor source of subgrade material for local roads and streets.

This complex is not assigned to a capability subclass.

71B—Vance fine sandy loam, 2 to 7 percent slopes. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops on the Piedmont. Slopes are smooth, commonly complex, and about 80 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 40 acres.

Typically, the surface layer is yellowish brown fine sandy loam about 8 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown, very firm, plastic clay that is strongly mottled with brighter colors. Gray mottles and colors are below a depth of about 23 inches. The substratum is yellowish brown, strong brown, light gray, and yellowish red clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; well drained Cecil, Cullen, Norfolk, Pacolet, Spotsylvania, and Wedowee soils; somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are in saddles and along small drainageways. The Bourne, Cecil, Cullen, Norfolk, Pacolet, Spotsylvania, and Wedowee soils are scattered throughout the mapped areas. The Colfax, Helena, Iredell, and Orange soils are on small upland flats, around the head of drainageways, and along drainageways. The Fluvaquents and the Worsham soils are along drainageways and streams. The included soils make up about 15 to 20 percent of this map unit.

Permeability is slow, and the available water capacity is moderate. Runoff is medium. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is slightly limited by the very firm subsoil at a depth of about 23 inches. The surface layer and the subsoil are commonly very strongly acid to extremely acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not affect the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. About one-fourth of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a large acreage is wooded. The potential productivity is moderately high. Most of the trees are pine and hardwoods.

This soil is limited for many urban uses because of its slow permeability, its moderate shrink-swell potential, and the low strength of the clay subsoil. Slow permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

71C2—Vance fine sandy loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes on the Piedmont. Slopes are smooth, commonly complex, and about 150 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 20 acres.

Typically, the surface layer is yellowish brown fine sandy loam about 5 inches thick. The subsoil is about 40 inches thick. It is mostly strong brown, very firm, plastic clay that is strongly mottled in brighter colors. Gray mottles and colors are below a depth of about 23 inches. The substratum is yellowish brown, strong brown, light gray, and yellowish red clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; well drained Cecil, Cullen, Norfolk, Pacolet, Spotsylvania, and Wedowee soils; somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are in saddles and along small drainageways. The Bourne, Cecil, Cullen, Norfolk, Pacolet, Spotsylvania, and Wedowee soils are scattered throughout the mapped areas. The Colfax, Helena, Iredell, and Orange soils are on small upland flats, around the head of drainageways, and along drainageways. The Fluvaquents and the Worsham soils are along drainageways and streams. The included soils make up about 15 to 20 percent of this map unit.

Permeability is slow, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is slightly limited by the very firm subsoil at a depth of about 21 inches. The surface layer and the subsoil are commonly very strongly acid to extremely acid unless

lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is moderately well suited to close-growing crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine and hardwoods. The potential productivity is moderately high.

This soil is limited for many urban uses because of its slow permeability, the moderate shrink-swell potential and the low strength of the clay subsoil, and slope. Slow permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

72B—Varina-Bourne complex, 2 to 7 percent slopes. This complex consists of gently sloping, well drained and moderately well drained soils. These soils are on somewhat broad, convex ridgetops on the western edge of the Coastal Plain. Slopes are smooth and complex and are about 200 to 800 feet long. Areas are elongated or irregularly rectangular and are 4 to 40 acres in size.

This complex is about 45 percent Varina gravelly sandy loam and about 35 percent Bourne fine sandy loam. Included soils make up the rest.

Typically, the surface layer of the Varina soil is dark grayish brown and light olive brown gravelly sandy loam about 7 inches thick. The subsoil to a depth of about 65 inches is mostly strong brown, friable, plastic clay loam that is strongly mottled below a depth of about 32 inches. The surface layer of the Bourne soil is grayish brown and light yellowish brown fine sandy loam about 10 inches thick. The subsoil in the upper part is yellowish brown, friable, slightly plastic sandy clay loam about 11 inches thick. In the lower part it is a fragipan about 44 inches thick. The fragipan consists of light yellowish brown and gray, brittle and compact, nonplastic sandy loam. The substratum is white, very firm and very plastic clay.

Included in mapping are small areas of moderately well drained to well drained Abell soils; well drained Appling, Cecil, Edgehill Variant, Faceville, Norfolk, Orangeburg, Spotsylvania, and Vance soils; and moderately well drained Duplin and Goldsboro soils. The Abell, Duplin, and Goldsboro soils are at the head of drainageways and along small drainageways. The Appling, Cecil, Edgehill Variant, Faceville, Norfolk, Orangeburg, Spotsylvania, and Vance soils are scattered throughout the mapped areas.

Permeability is moderate to slow in the Varina soil and slow to very slow in the Bourne soil. The available water capacity is moderate in the Varina soil and low in the Bourne soil. Runoff is medium. Erosion is a moderate hazard. Tilth is good, but the Varina soil contains enough pebbles to dull and damage plowshares. The soils are low in natural fertility and in content of organic matter. The subsoil is slightly plastic to plastic and has low shrink-swell potential. In the Bourne soil, the root zone extends to about 24 inches; root growth is severely limited by the fragipan, which is commonly at a depth of 18 to 34 inches. In the Varina soil, the root zone extends to a depth of about 60 inches, but root growth is moderately limited below a depth of about 42 inches by a firm dense layer. The surface layer and the subsoil of these soils are commonly strongly acid to extremely acid unless lime has been applied. In most places, these soils are deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

The soils in this complex are moderately well suited to cultivated crops and to pasture and hay. About one-half of the acreage is farmed. Alfalfa is short lived on the Bourne soil because of seasonal wetness and severely restricted root growth. The Bourne soil is droughty during the growing season. Pebbles in the surface layer of the Varina soil can interfere with tillage and planting and damage farm equipment. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems. Artificial drainage is needed on the Bourne soil.

If these soils are cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive. Grazing the Bourne soil during periods of wetness can cut up and compact the surface soil, thus reducing yields and accelerating erosion.

The soils in this complex are suited to trees and about one-half of the acreage is wooded. Most of the trees are

pine. The potential productivity is moderate to moderately high. On the Bourne soil, the use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness. Windthrow is a moderate hazard on the Bourne soil.

The Bourne soil is limited for some urban uses and for use as septic tank absorption fields because of the slow to very slow permeability and a seasonal high water table. The Varina soil is limited for these uses because of the moderate to slow permeability. The Varina soil has slight limitations and the Bourne soil has moderate limitations for use as sites for houses and other small structures. These soils are a fair source of subgrade material for local roads and streets.

This complex is in capability subclass IIe.

73—Wahee loam. This is a level, somewhat poorly drained soil on narrow to somewhat broad, low-lying terraces along the larger streams on the Piedmont and the Coastal Plain. Most areas are elongated. Some small areas are irregularly oval and slightly concave. Areas range in size from 5 acres to 30 acres.

Typically, the surface layer is dark grayish brown loam about 8 inches thick. The subsoil is about 57 or more inches thick. In the upper 46 inches, it is mostly gray, firm, plastic silty clay that is commonly mottled. Below that, to a depth of about 65 inches, it is gray, micaceous silty clay loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, moderately well drained Altavista and Dogue soils, somewhat poorly drained Fork soils, somewhat poorly drained to moderately well drained Iredell and Orange soils, poorly drained Fluvaquents, and poorly drained Forestdale soils. The Abell, Iredell, and Orange soils are slightly higher on the landscape than the Wahee soil; they are along the edges of the mapped areas next to the uplands. The Altavista and Dogue soils also are slightly higher on the landscape than the Wahee soils. The Fork soils are scattered throughout the mapped areas. The Fluvaquents and the Forestdale soils are along drainageways and streams. The included soils make up about 15 percent of this map unit.

Permeability is slow and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is quite deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is occasionally flooded for brief periods in spring and early in summer.

This soil is moderately well suited to cultivated crops and to pasture. It is also moderately well suited to hay; however, alfalfa is short-lived because of seasonal wetness. Much of the acreage of this soil is farmed. The low content of organic matter, the acidity, and the low natural fertility are management problems. Flood control and artificial drainage are needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees, and a moderate acreage is wooded. The trees are pine and hardwoods. The potential productivity is high. The use of equipment generally needed in woodland management or harvesting is moderately limited by seasonal wetness. Seedling mortality is a moderate hazard.

This soil is limited for many urban uses because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIw.

74B2—Wedowee fine sandy loam, 2 to 7 percent slopes, eroded. This is a gently sloping, well drained soil on narrow to somewhat broad, convex ridgetops on the Piedmont. Slopes are smooth, commonly complex, and about 100 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 50 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil is about 28 inches thick. It is mostly strong brown and yellowish red, friable, plastic clay loam and clay and is mottled below a depth of about 30 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; well drained Cecil, Norfolk, Spotsylvania, Turbeville, Vance, and Varina soils; and somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils. The Abell soils are in saddles and along small drainageways. The Bourne, Cecil, Norfolk, Spotsylvania, Turbeville, Vance, and Varina soils are scattered throughout the mapped areas. The Helena, Colfax, Iredell, and Orange soils are on small upland flats, at the head of drainageways, along drainageways, and in slightly concave areas. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium. Erosion is a mod-

erate hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help reduce runoff and control erosion and increase the content of organic matter. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability and moderate shrink-swell potential. Moderate permeability is also a limitation to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIe.

74C2—Wedowee fine sandy loam, 7 to 15 percent slopes, eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes on the Piedmont. Slopes are smooth, commonly complex, and about 120 to 400 feet long. Areas are commonly long and winding. They range in size from 4 acres to more than 100 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil is about 28 inches thick. It is mostly strong brown and yellowish red, friable, plastic clay loam and clay and is mottled below a depth of about 30 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Bourne and Helena soils; well drained Cecil, Turbeville, Vance, and Varina soils; somewhat poorly drained Chewacla soils; somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; and poorly drained Worsham soils. The Abell soils are along small drainageways and on toe slopes. The Bourne, Cecil, Turbeville, Vance, and Varina soils are scattered throughout the mapped areas. The Helena, Colfax, Iredell, and Orange soils are along drainageways. The Chewacla and Worsham soils and the Fluvaquents are along drainageways and streams. The included soils make up about 15 to 20 percent of this unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a severe hazard. Tilth is fair, but natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is moderately well suited to cultivated crops and to pasture and hay. Some of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and a moderate acreage is wooded. Most of the trees are pine. The potential productivity is moderately high.

This soil is limited for many urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. Moderate permeability and slope are also limitations to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IIIe.

74D2—Wedowee fine sandy loam, 15 to 30 percent slopes, eroded. This is a moderately steep, well drained soil on narrow, convex side slopes along drainageways on the Piedmont. Slopes are smooth, commonly complex, and about 140 to 500 feet long. Areas follow the ridges and drainageways and are commonly long and winding. They range in size from 4 acres to more than 100 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil is about 28 inches thick. It is mostly strong brown and yellowish red, friable,

plastic clay loam and clay and is mottled below a depth of about 30 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, well drained to excessively drained Ashlar soils, somewhat poorly drained Chewacla soils, poorly drained Fluvaquents, poorly drained Worsham soils, and well drained Vance soils. The Abell soils are mainly on toe slopes and along small drainageways. The Ashlar soils are scattered throughout the mapped areas. The Chewacla and Worsham soils and the Fluvaquents are along drainageways and streams. The Vance soils are mainly on the upper part of side slopes. Also included, in spots, are soils that have a surface layer of strong brown clay loam and gravelly sandy loam, and rock outcrop. The included soils and rock outcrop make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair. Natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and most of the acreage is wooded. Most of the trees are pine. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope, and the hazard of erosion from the use of this equipment is moderate.

This soil is limited for many urban uses and for use as septic tank absorption fields because of slope. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

75C3—Wedowee clay loam, 7 to 15 percent slopes, severely eroded. This is a sloping, well drained soil on narrow, convex ridgetops and on narrow, convex side slopes on the Piedmont. Slopes are smooth or irregular, commonly complex, and about 120 to 400 feet long. Areas follow the ridges and are commonly long and winding. They range in size from 4 acres to 20 acres.

Typically, the surface layer is strong brown clay loam about 5 inches thick. The subsoil is about 23 inches thick. It is mostly strong brown and yellowish red, friable, plastic clay loam and clay and is mottled below a depth of about 25 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils; somewhat poorly drained to moderately well drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; well drained Spotsylvania and Vance soils; and poorly drained Worsham soils. The Abell, Colfax, Iredell, and Orange soils are at the head of small drainageways and along small drainageways. The Fluvaquents and the Worsham soils are along drainageways and small streams. The Spotsylvania and Vance soils are mainly on narrow ridges. The included soils make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is medium to rapid. Erosion is a very severe hazard. Tilth is poor, and natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops. It is better suited to close-growing crops and to pasture and hay. Much of the acreage is farmed. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is cultivated, minimum tillage and grasses and legumes in the cropping system can help reduce runoff and control erosion. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and some of the acreage is wooded. Most of the trees are pine. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is moderately limited by the clay loam surface layer, and the

hazard of erosion from the use of this equipment is moderate. The hazard of seedling mortality is moderate.

This soil is limited for many urban uses because of its moderate permeability, moderate shrink-swell potential, and slope. Moderate permeability and slope are also limitations to the use of this soil as septic tank absorption fields. This soil is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass IVe.

75D3—Wedowee clay loam, 15 to 25 percent slopes, severely eroded. This is a moderately steep, well drained soil on narrow, convex side slopes along drainageways on the Piedmont. Slopes are smooth or irregular, commonly complex, and about 200 to 600 feet long. Areas are commonly long and winding. They range in size from 4 to 10 acres.

Typically, the surface layer is strong brown clay loam about 5 inches thick. The subsoil is about 23 inches thick. It is mostly strong brown and yellowish red, friable, plastic clay loam and clay and is mottled below a depth of about 25 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam.

Included in mapping are small areas of moderately well drained to well drained Abell soils, well drained to excessively drained Ashlar soils, somewhat poorly drained Chewacla soils, poorly drained Fluvaquents, and poorly drained Worsham soils. The Abell soils are on toe slopes and along small drainageways. The Ashlar soils are scattered throughout the mapped areas. The Chewacla and Worsham soils and the Fluvaquents are along drainageways and streams. Also included are small areas of soils that have a gravelly surface layer and, in spots, rock outcrop. The included soils and rock outcrop make up about 15 percent of this map unit.

Permeability is moderate, and the available water capacity is moderate. Runoff is rapid. Erosion is a very severe hazard. Tilth is poor, and natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are commonly very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is not suited to cultivated crops. It is moderately well suited to pasture and hay. Erosion is a major management problem. The low content of organic matter, the acidity, and the low natural fertility are also problems.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

This soil is suited to trees, and much of the acreage is wooded. Most of the trees are pine, for which the hazard of seedling mortality is moderate. The potential productivity is moderate. The use of equipment generally needed in woodland management or harvesting is severely limited by the clay loam surface layer and slope, and the hazard of erosion from the use of this equipment is severe.

This soil is limited for many urban uses and for use as septic tank absorption fields because of slope. It is a fair source of subgrade material for local roads and streets.

This map unit is in capability subclass VIe.

76D—Wedowee-Ashlar complex, 15 to 25 percent slopes. This complex consists of moderately steep, well drained to excessively drained soils. These soils are on narrow, convex side slopes along drainageways and small streams. Slopes are smooth and complex and are about 140 to 600 feet long. Areas are commonly long and winding. They range in size from about 4 to 50 acres.

This complex is about 35 percent well drained Wedowee fine sandy loam and about 30 percent well drained to excessively drained Ashlar sandy loam. Included soils make up the rest.

Typically, the surface layer of the Wedowee soil is brown fine sandy loam about 5 inches thick. The subsoil is about 28 inches thick. It is mostly strong brown and yellowish red clay loam and clay with mottles below a depth of about 30 inches. The substratum is red, yellowish brown, and pinkish white, micaceous loam. The surface layer of the Ashlar soil is dark grayish brown and brown sandy loam about 11 inches thick. The subsoil is brown gravelly sandy loam about 12 inches thick. The substratum extends to a depth of 30 inches. It is yellowish brown gravelly loam. It is underlain by bedrock.

Included in mapping are small areas of well drained Edgehill Variant and Vance soils, poorly drained Fluvaquents, and rock outcrop. The Edgehill Variant and Vance soils are mainly on the upper part of the side slopes. The Fluvaquents are along drainageways and small streams. The rock outcrops, mostly granite or granite-gneiss, are on the lower part of the side slopes. Also included, in spots, are soils that have a surface layer of gravelly sandy loam.

Permeability is moderate to rapid. The available water capacity is moderate to low. Runoff is rapid. Erosion is a very severe hazard. Tilth is fair. Natural fertility and the content of organic matter are low. The subsoil has a moderate to low shrink-swell potential. The root zone extends to a depth of about 24 to 60 inches. The surface layer and the subsoil are commonly strongly acid to very strongly acid unless limed. Bedrock is at a depth of 24 to 60 inches or more.

The soils in this complex are not suited to cultivated crops because of the slope, the hazard of erosion, and droughtiness; but they are moderately well suited to pasture and some hay crops. Erosion is a major management concern.

If these soils are used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, runoff increases and erosion is excessive.

The soils in this complex are suited to trees, and most of the acreage is wooded. The potential productivity is moderately high. The use of equipment generally needed in woodland management or harvesting is moderately limited by slope. The hazard of erosion from the use of this equipment is moderate.

These soils are limited for urban uses because of slope. They are a poor source of subgrade material for local roads and streets.

This complex is in capability subclass VIe.

77—Wehadkee loam. This is a nearly level, poorly drained soil on narrow to broad flood plains along streams and large drainageways on the Piedmont and the Coastal Plain. Areas are commonly elongated. They are 4 to more than 80 acres in size.

Typically, the surface layer is grayish brown loam about 8 inches thick. The subsoil to a depth of about 92 inches is mostly olive gray and gray, friable, plastic to slightly plastic clay loam, sandy clay loam, and loam. It is strongly mottled in brighter colors.

Included in mapping are small areas of moderately well drained to well drained Abell soils; moderately well drained Altavista, Goldsboro, and Helena soils; somewhat poorly drained Augusta, Chewacla, and Wahee soils; somewhat poorly drained Colfax soils; poorly drained Fluvaquents; poorly drained Forestdale and Worsham soils; and well drained Pamunkey soils. The Abell, Altavista, Goldsboro, Helena, Colfax, and Pamunkey soils are on the higher-lying parts of the mapped areas, along the edges next to the uplands, or they are scattered throughout the mapped areas. The Augusta, Chewacla, Wahee, Forestdale, and Worsham soils and the Fluvaquents are scattered throughout the mapped areas. Also included, in spots, are sandy soils, gravelly soils, soils that have a clay loam surface layer, or very poorly drained soils. The included soils make up about 15 to 20 percent of this map unit.

Permeability is moderate, and the available water capacity is high. Runoff is slow. Erosion is a slight hazard. Tilth is fair. Natural fertility is low, and the content of organic matter is moderate. The subsoil is plastic to slightly plastic and has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and the subsoil are very strongly acid to extremely acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil. This soil is commonly flooded for brief periods in winter, in spring, and early in summer.

This soil is suited to cultivated crops only if it is drained and protected from flooding. It is moderately well suited to pasture.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes and overgrazing are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields. Flood control and artificial drainage are needed.

This soil is suited to trees, and a large acreage is wooded. The trees are pine and hardwoods. The potential productivity is very high. Seedling mortality is a severe hazard. The use of equipment generally needed in woodland management or harvesting is severely limited by seasonal wetness and flooding.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table and flooding. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass VIw.

78—Worsham fine sandy loam. This is a nearly level soil on broad, low-lying upland flats, in slight upland depressions, and in slightly concave areas at the head of drainageways on the Piedmont. Areas are irregularly rectangular or irregularly oval and are about 200 to more than 1,000 feet wide. They range in size from 4 acres to more than 30 acres.

Typically, the surface layer is gray and light brownish gray fine sandy loam about 11 inches thick. The subsoil is about 49 inches thick. It is mostly light brownish gray and gray, firm, plastic clay loam, clay, and sandy clay loam.

Included in mapping are small areas of well drained to moderately well drained Abell soils; somewhat poorly drained Colfax, Iredell, and Orange soils; poorly drained Fluvaquents; and moderately well drained Helena soils. The Abell, Colfax, Iredell, Helena, and Orange soils are mainly on the slightly higher lying parts of the mapped areas, along the edges next to the uplands. Fluvaquents are along drainageways and small streams. Also included are small areas of ponded soils and, in spots, very poorly drained soils. The included soils make up about 15 to 20 percent of the map unit.

Permeability is moderately slow to very slow, and the available water capacity is moderate. Runoff is slow. Erosion is a slight hazard. Tilth is good, but the soil is wet and cold in spring and early in summer. Natural fertility and the content of organic matter are low. The subsoil is plastic and has a moderate shrink-swell potential. The root zone extends to a depth of about 60 inches, but root growth is somewhat limited by wetness below a depth of about 35 inches. The surface layer and

the subsoil range from very strongly acid to strongly acid unless lime has been applied. In most places, this soil is deep to bedrock; therefore, bedrock generally does not limit the use of this soil.

This soil is poorly suited to cultivated crops and moderately well suited to pasture and hay. Alfalfa is short-lived because of seasonal wetness. Acidity and low natural fertility are management problems. Artificial drainage is needed.

If this soil is cultivated, minimum tillage, grasses and legumes in the cropping system, and crop residue can help increase the content of organic matter and maintain the tilth of the soil. Lime is needed to reduce the acidity of the soil, and fertilizer is needed to improve fertility.

If this soil is used as pasture, establishing and maintaining a desirable mixture of grasses and legumes, overgrazing, and wetness are major management problems. Proper stocking rates, pasture rotation, deferred grazing, and the use of lime and fertilizer to offset the acidity and low natural fertility of the soil can help overcome these problems. If the pasture is overgrazed, some of the desirable grasses and legumes die out and yields are reduced. Grazing during periods of wetness can cut up and compact the surface soil, thus reducing yields.

This soil is suited to trees and most of the acreage is wooded. The potential productivity is high. The trees are pine and hardwoods, for which the hazard of seedling mortality is severe. The use of equipment generally needed in woodland management or harvesting is severely limited by long periods of wetness.

This soil is limited for many urban uses and for use as septic tank absorption fields because of a seasonal high water table. It is a poor source of subgrade material for local roads and streets.

This map unit is in capability subclass Vw.

Use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Soil maps for detailed planning." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely

to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

Land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The capability classification of each map unit is given in the section "Soil maps for detailed planning."

Woodland management and productivity

Luitpold W. Kempf, woodland conservationist, Soil Conservation Service, assisted in preparing this section.

Before the survey area was settled, the woodland consisted of mixed stands of chestnut oak, white oak, post oak, scarlet oak, black oak, northern red oak, southern red oak, and hickory. Yellow-poplar grew on the moister soils. Shortleaf pine and Virginia pine were scattered throughout the stands of hardwood. The poorly drained soils supported mixed stands of green ash, sweetgum, black gum, boxelder, and red maple.

Much of the original woodland was cleared for farming. Much of this farmland has been abandoned and has reverted to woodland. Now, about 68 percent of the survey area is woodland, consisting mainly of mixed hardwoods, Virginia pine, loblolly pine, and shortleaf pine.

Table 6 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restric-

tions are insignificant. If a soil has more than one limitation, the priority is as follows: w, d, c, s, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index.* This index is the average height, in feet, that dominant and codominant trees of a given species attain in 50 years; and it applies to fully stocked, even-aged, unmanaged stands. Site index is listed for trees that woodland managers generally favor in intermediate or improvement cuttings. The trees are selected on the basis of growth rate, quality, value, and marketability. Other trees that are common on the soil are also listed regardless of potential value and growth potential.

Trees to plant are those that are suited to the soils and to commercial wood production.

Recreation

R. F. Dugan, biologist, Soil Conservation Service, helped prepare this section.

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty

when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife habitat

R. F. Dugan, biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild

herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas (fig. 5). Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

H. Tillman Marshall, assistant state conservation engineer, assisted in preparing this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Figure 5.—Hydraquents, nearly level, provide good habitat for wetland wildlife.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building site development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less

than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of these materials. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate

shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. The ratings in table 11 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 13.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water management

Table 12 gives information on the soil properties and site features that affect water management.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a

slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering properties

Table 13 gives estimates of the engineering classification and of the range of properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and chemical properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are

given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Soil and water features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes is not considered flooding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that

flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15. Only saturated zones within a depth of about 6 feet are indicated.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*4*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 16, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning udic or humid, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that have a udic or humid moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great

group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is clayey, kaolinitic, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil series and morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*3*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*4*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Soil maps for detailed planning."

Abell series

Soils of the Abell series are fine-loamy, mixed, thermic Aquic Hapludults. They are deep, moderately well drained to well drained soils that have a subsoil consisting mostly of yellowish brown and light olive brown sandy clay loam, clay loam, and clay. These soils formed in a layer of alluvium washed from surrounding soils and in the underlying residuum of granite-gneiss. They are in shallow depressions and at the head of drainageways on the Piedmont. Slopes range from about 2 to 7 percent.

Abell soils are commonly near Appling, Cecil, Colfax, Pacolet, Wedowee, and Worsham soils. They are less well drained than the Appling, Cecil, Pacolet, and Wedowee soils. They do not have the fragipan of the Colfax soils, and they are not as poorly drained as the Worsham soils.

Typical pedon of Abell fine sandy loam, 2 to 7 percent slopes, about three-fourths of a mile north of the intersection of Routes 722 and 631 and about 200 feet east of Route 722:

Ap—0 to 11 inches; dark brown (7.5YR 4/4) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; common medium and fine roots; few fine pores; strongly acid; gradual smooth boundary.

A2—11 to 15 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; strongly acid; clear smooth boundary.

B1t—15 to 19 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium and fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; thin patchy clay films; 5 percent angular quartz pebbles that are as much as 7 millimeters in diameter; very strongly acid; gradual smooth boundary.

B21t—19 to 27 inches; yellowish brown (10YR 5/6) clay loam; weak fine subangular blocky structure; friable, slightly sticky and plastic; few fine roots; few very fine flakes of mica; thin patchy clay films; 3 percent angular quartz pebbles that are as much as 40 millimeters in diameter; very strongly acid; gradual smooth boundary.

IIB22t—27 to 32 inches; yellowish brown (10YR 5/6) clay; common fine prominent yellowish red (5YR 5/6) mottles; moderate medium and fine subangular blocky structure; firm, sticky and plastic; few fine roots; thin continuous yellowish brown (10YR 5/4) clay films; many fine flakes of mica; very strongly acid; gradual smooth boundary.

IIB3t—32 to 39 inches; light olive brown (2.5Y 5/4) clay; common medium prominent yellowish red (5YR 4/6), common medium faint light brownish gray (2.5Y 6/2), and few fine distinct gray (10YR 6/1) mottles; weak and moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; thin patchy clay films; many fine mica flakes; very strongly acid; gradual smooth boundary.

IIC—39 to 60 inches; streaked gray (10YR 5/1 and 6/1), yellowish red (5YR 4/6 and 4/8), and strong brown (7.5YR 5/6) loam; massive; friable, nonsticky and nonplastic; few clay flows in upper part; many fine mica flakes; very strongly acid.

The solum is commonly 35 to 55 inches thick. The IIB horizon is at a depth of 24 to 36 inches. Bedrock is at a depth of more than 5 feet. Angular and subrounded quartz pebbles, 2 to 75 millimeters in diameter, make up 3 to 10 percent of the upper part of the solum and 0 to 5 percent of the lower part of the solum and the substratum.

The A horizon has hue of 7.5YR or 10YR, value of 4 and 5, and chroma of 3 through 6.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 and 5, and chroma of 4 to 8. It has gray mottles in the

lower part and ranges from sandy clay loam and clay loam to clay.

The C horizon ranges from sandy loam to clay loam.

Altavista series

Soils of the Altavista series are fine-loamy, mixed, thermic Aquic Hapludults. They are deep, moderately well drained soils that have a subsoil that consists mostly of yellowish brown sandy clay loam and sandy loam and is mottled with gray below a depth of about 27 inches. These soils formed in alluvium on stream terraces on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Altavista soils are commonly near Augusta, Dogue, Fork, Pamunkey, and Wahee soils. They are not as poorly drained as the Augusta, Fork, and Wahee soils. They have less clay than the Dogue soils, and they are not as well drained as the Pamunkey soils.

Typical pedon of Altavista fine sandy loam, north of farm lane, one-half mile southeast of junction of U.S. 360 and Route 605, two-thirds of a mile west of the Pamunkey River:

Ap—0 to 8 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine and medium roots; many fine and medium pores; few small pockets of material from the A2 horizon in lower part; very strongly acid; abrupt wavy boundary.

A2—8 to 13 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine granular structure; very friable, slightly sticky and nonplastic; few fine and medium roots; many fine and medium pores; very strongly acid; clear wavy boundary.

B1—13 to 18 inches; yellowish brown (10YR 5/8) fine sandy loam; few medium distinct light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; many fine and medium pores; common bridging between sand grains; few fine black concretions; strongly acid; clear smooth boundary.

B21t—18 to 27 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine faint strong brown (7.5YR 5/6) mottles; weak medium and fine subangular blocky structure; friable, sticky and slightly plastic; few fine roots; common fine and medium pores; common thin clay films; few fine black concretions; few fine flakes of mica; very strongly acid; clear smooth boundary.

B22t—27 to 32 inches; yellowish brown (10YR 5/8) sandy clay loam; many medium and coarse distinct gray (10YR 6/1) mottles; weak medium and coarse subangular blocky structure; friable, sticky and slightly plastic; few fine roots; common fine and medium pores; few thin clay films; few fine black concretions; few fine mica flakes; very strongly acid; clear wavy boundary.

B3t—32 to 41 inches; light yellowish brown (10YR 5/6) sandy loam; many coarse faint gray (10YR 6/1) and many coarse distinct strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; few thin clay films; common fine black concretions; few fine mica flakes; very strongly acid; clear wavy boundary.

C—41 to 90 inches; strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), pale brown (10YR 6/3), and gray (10YR 6/1) loamy sand; single grain; loose; common fine black concretions; few fine mica flakes; strongly acid.

The solum is 30 to 60 inches thick. Bedrock is at a depth of more than 5 feet. The solum contains few to common fine mica flakes in the lower part and, in some pedons, throughout.

The A horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4.

The Bt horizon has hue of 10YR, 7.5YR, or 2.5Y; value of 4 through 6; and chroma of 4 through 8. It has gray mottles in the lower part. In some pedons, it is gray in the lower part. It ranges to sandy loam and clay loam.

The C horizon ranges from loamy sand to clay loam. In some pedons, it is gravelly.

Appling series

Soils of the Appling series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that consists mostly of strong brown sandy clay loam, clay loam, and clay and has high-chroma mottles in the lower part. These soils formed in material that weathered from granite and gneiss. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 15 percent but are dominantly 2 to 7 percent.

Appling soils are commonly near Cecil, Edgehill Variant, Ashlar, Pacolet, Wedowee, and Vance soils. They are not so red as the Cecil and Pacolet soils, and they have a thicker B2t horizon than the Pacolet soils. They do not have the high pebble content of the Edgehill Variant soils. They have a thicker solum than the Ashlar soils, and they have an argillic horizon, which the Ashlar soils do not have. They have a thicker B2t horizon than the Wedowee soils. They do not have the very firm, plastic Bt horizon of the Vance soils.

Typical pedon of Appling fine sandy loam, 2 to 7 percent slopes, 400 feet north and 150 feet east of the intersection of Routes 733 and 680:

A1—0 to 2 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine roots; very strongly acid; clear smooth boundary.

A2—2 to 8 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine granular structure; very fri-

able, nonsticky and nonplastic; common fine roots; few medium and coarse roots; common fine pores; very strongly acid; clear smooth boundary.

B1t—8 to 15 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; many fine pores; thin patchy clay films; 1 percent angular quartz pebbles that are as much as 75 millimeters in diameter; very strongly acid; clear smooth boundary.

B21t—15 to 20 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine and medium pores; thin patchy clay films; 1 percent angular quartz pebbles that are as much as 75 millimeters in diameter; very strongly acid; gradual smooth boundary.

B22t—20 to 33 inches; strong brown (7.5YR 5/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin patchy clay films; 1 percent angular quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; strongly acid; clear wavy boundary.

B23t—33 to 44 inches; strong brown (7.5YR 5/6) clay; common fine distinct yellowish red (5YR 4/6) and brownish yellow (10YR 6/6) mottles; moderate very thick platy structure parting to moderate medium subangular blocky; firm, slightly sticky and slightly plastic; few fine roots; few fine pores; thin patchy clay films; 1 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; strongly acid; clear wavy boundary.

B24t—44 to 52 inches; strong brown (7.5YR 4/5), yellowish red (5YR 4/6), brownish yellow (10YR 6/6), and red (2.5YR 4/8) clay loam; weak very thick platy structure parting to weak medium subangular blocky; friable, slightly sticky and slightly plastic; few fine roots; thin patchy clay films; 1 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; common fine mica flakes; very strongly acid; gradual wavy boundary.

C—52 to 60 inches; strong brown (7.5YR 5/6) yellowish red (5YR 4/6), brownish yellow (10YR 6/6), red (2.5YR 4/8), and white (10YR 8/2) saprolite that crushes easily to loam; rock-controlled structure; friable, slightly sticky and slightly plastic; few thin clay flows; 2 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; common fine mica flakes; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet. Angular and subangular quartz pebbles, as much as 75 millimeters in diameter, make up less than 1 percent to about 25 percent of the A horizon and less than 1 percent to about 15 percent of the B and C horizons.

The A horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 6. It ranges to gravelly sandy loam.

The B horizon has hue of 10YR, 7.5YR, or 5YR; value of 4 and 5, and chroma of 6 through 8. High-chroma mottles are common in the lower part.

The C horizon is streaked and mottled in hue of 2.5YR through 2.5Y, and it ranges from sandy loam to sandy clay loam.

Aquults

Aquults are poorly drained soils that formed in local alluvium, Coastal Plain sediments, or material that weathered from bedrock. They are on upland flats, at the head of drainageways, and along drainageways on the Piedmont. Slopes are 0 to 2 percent.

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the suborder.

Generally, the A horizon is gray fine sandy loam about 10 inches thick.

The B horizon to a depth of about 30 inches is gray or light gray with some mottles of brighter color. It is commonly clay but ranges to clay loam and sandy loam. Below that, to a depth of about 60 inches, it is gray or light gray, brittle and compact sandy loam or sandy clay loam to weakly cemented sandstone.

In some soils, the A horizon and the B horizon are 5 to 20 percent rounded quartz pebbles that are as much as 3 inches in diameter.

These soils are commonly strongly acid to very strongly acid throughout.

Ashlar series

Soils of the Ashlar series are coarse-loamy, mixed, thermic Typic Dystrochrepts. They are moderately deep, well drained to excessively drained soils that have a subsoil that is mostly brown gravelly sandy loam. They are underlain by bedrock at a depth of 24 to 40 inches. These soils formed in material that weathered from granite and granite-gneiss. They are on narrow ridges and side slopes on the Piedmont. Slopes range from 5 to 25 percent.

Ashlar soils are commonly near Appling, Edgehill Variant, and Wedowee soils. They do not have the argillic horizon of the Appling, Edgehill Variant, and Wedowee soils, and they contain fewer pebbles than the Edgehill Variant soils. In this survey area, the Ashlar soils are mapped only in complex with Appling soils and with Wedowee soils.

Typical pedon of Ashlar sandy loam in an area of Wedowee-Ashlar complex, 15 to 25 percent slopes, about 500 feet north of Beech Creek, 50 feet west of Route 657, 400 feet east-southeast of the junction of Routes 670 and 657:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; friable, slight-

ly sticky and nonplastic; many fine and medium roots; common fine and medium pores; 1 percent angular quartz pebbles that are as much as 25 millimeters in diameter; strongly acid; clear smooth boundary.

A2—4 to 11 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; few fine, medium, and coarse roots; common fine and medium pores; 5 percent angular quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; clear smooth boundary.

B2—11 to 23 inches; brown (10YR 4/3) gravelly sandy loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine and medium pores; pockets and lenses of brown (10YR 4/3) sandy clay loam, 2 to 10 inches thick, make up about 40 percent of this horizon; 25 percent angular quartz pebbles that are as much as 50 millimeters in diameter; common fine mica flakes; very strongly acid; clear wavy boundary.

C—23 to 30 inches; yellowish brown (10YR 5/4) gravelly sandy loam saprolite; rock-controlled structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; 25 percent angular quartz pebbles that are as much as 75 millimeters in diameter; common fine mica flakes; very strongly acid.

R—30 inches; granite.

The solum is 15 to 32 inches thick. Bedrock is at a depth of 2 to 3 1/2 feet. Angular quartz pebbles that are as much as 75 millimeters in diameter make up 0 to 25 percent of the solum and the substratum. Cobblestones of quartz and granite make up 0 to 10 percent of the solum and the substratum.

The A horizon has hue of 10YR and 2.5Y, value of 4 and 5, chroma of 2 to 4.

The B horizon and the C horizon have hue of 10YR, 7.5YR, and 5YR; value of 4 through 6; and chroma of 3 through 8.

Atlee series

Soils of the Atlee series are fine-loamy, siliceous, thermic Fragiaquic Paleudults. They are deep, moderately well drained soils that have a thick subsoil that consists mostly of light olive brown and yellowish brown loam and that is mottled, mainly in shades of red and gray, below a depth of about 22 inches. These soils formed in loamy, fluviomarine sediments. They are on broad ridges and in low-lying areas on the Coastal Plain. Slopes range from 0 to 4 percent.

Atlee soils are commonly near Caroline, Coxville, Dogue, Dunbar, and Duplin soils. Atlee soils have less clay than these soils. They are not as well drained as the Caroline soils and are better drained than the Coxville and Dunbar soils.

Typical pedon of Atlee loam, 0 to 4 percent slopes, 350 feet south of Route 647, about one-fourth mile east of Brown Grove Baptist Church:

Ap—0 to 9 inches; grayish brown (2.5Y 5/2) loam; weak fine granular structure; friable, nonsticky and nonplastic; common fine roots; few medium and coarse roots; very strongly acid; clear smooth boundary.

B1t—9 to 14 inches; light olive brown (2.5Y 5/6) loam; few medium distinct yellowish brown (10YR 5/8) mottles; weak medium and fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine pores; very strongly acid; clear smooth boundary.

B21t—14 to 22 inches; light olive brown (2.5Y 5/6) loam; many fine and medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; few thin clay films in pores; strongly acid; clear smooth boundary.

B22t—22 to 27 inches; yellowish brown (10YR 5/6) clay loam; many medium distinct light yellowish brown (2.5Y 6/4), few fine and medium distinct strong brown (7.5YR 5/8), and few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; common fine pores; thin patchy clay films; very strongly acid; clear wavy boundary.

B23t—27 to 52 inches; mottled light olive brown (2.5Y 5/4), yellowish brown (10YR 5/4 and 5/6), strong brown (7.5YR 5/6), and gray (10YR 6/1) loam; weak very thick platy structure parting to weak medium angular blocky; firm, about 45 percent of mass is brittle and compact; slightly sticky and slightly plastic; 1/2- to 1-inch-long vertical gray (10YR 6/1) streaks extending into B3t horizon; few fine roots; few fine vesicular pores; thin patchy clay films; very strongly acid; gradual wavy boundary.

B3t—52 to 89 inches; yellowish brown (10YR 5/6), red (2.5YR 4/8), yellowish red (5YR 4/8), gray (10YR 6/1), and light brownish gray (2.5Y 6/2) loam; weak medium angular blocky and weak medium and thick platy structure; firm, slightly sticky and slightly plastic; thin patchy clay films; very strongly acid.

The solum is 50 to more than 60 inches thick.

The A horizon has hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 2 through 4.

The Bt horizon above the brittle and compact layer has hue of 10YR, 7.5YR, or 2.5Y; value of 4 through 6; and chroma of 4 through 8. It ranges to silt loam, clay loam, and silty clay loam. The brittle and compact layer is commonly at a depth of 24 to 36 inches and is brittle and compact in 20 to 50 percent of its mass. It is mottled and has hue of 2.5Y, 10YR, or 7.5YR; value of 4 through 6; and chroma of 1 through 6. This layer is loam, silt loam, clay loam, or silty clay loam. The B3t horizon

has hue of 2.5Y to 2.5YR, value of 4 through 6, and chroma of 1 through 8. It is loam, silt loam, sandy clay loam, clay loam, silty clay loam, or clay.

Augusta series

Soils of the Augusta series are fine-loamy, mixed, thermic Aeric Ochraquults. They are deep, somewhat poorly drained soils that have a subsoil that is mostly light olive gray clay loam. These soils formed in alluvium and are on stream terraces on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Augusta soils are commonly near Altavista, Dogue, Fork, Pamunkey, and Wahee soils. They are more poorly drained than the Altavista, Dogue, and Pamunkey soils, and they have less clay than the Dogue soils. They are more acid throughout than the Fork soils, and they have less clay than the Wahee soils.

Typical pedon of Augusta fine sandy loam, about 4,500 feet south of the junction of Routes 628 and 630, by a lane leading to the Chickahominy River:

Ap—0 to 7 inches; dark grayish brown (2.5Y 5/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine, medium, and coarse roots; many fine and medium pores; very strongly acid; abrupt smooth boundary.

B1t—7 to 10 inches; yellowish brown (10YR 5/6) loam; common fine distinct strong brown (7.5YR 5/6) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; many fine and medium pores; thin patchy clay films; few fine mica flakes; very strongly acid; clear smooth boundary.

B21t—10 to 19 inches; mottled strong brown (7.5YR 5/6) and light olive gray (5Y 6/2) clay loam; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium pores; thin continuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

B22tg—19 to 33 inches; light olive gray (5Y 6/2) clay loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; thin patchy clay films; common fine mica flakes; very strongly acid; gradual smooth boundary.

B3tg—33 to 50 inches; light olive gray (5Y 6/2) sandy loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; thin patchy clay films; common fine mica flakes; very strongly acid; abrupt irregular boundary.

Cg—50 to 76 inches; mottled olive (5Y 5/6), pale olive (5Y 6/4), and yellowish brown (10YR 5/8) loamy sand; single grain; loose, nonsticky and nonplastic; about 10 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; common fine black concretions; common fine mica flakes; very strongly acid.

The solum is 40 to more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, 2 to 75 millimeters in diameter, make up 0 to 10 percent of the solum and 2 to 30 percent of the substratum.

The A horizon has hue of 2.5Y or 10YR, value of 4 and 5, and chroma of 1 through 4.

The B horizon has hue of 10YR, 2.5Y, and 5Y; value of 4 through 6; and chroma of 1 through 6. It ranges to sandy clay loam, loam, and sandy loam.

The C horizon ranges to loam, gravelly loamy sand, and gravelly sandy loam.

Bolling Variant

The Bolling Variant soils are loamy-skeletal, mixed, thermic Mollic Hapludalfs. They are deep, moderately well drained soils that have a B horizon consisting of dark yellowish brown and dark brown very gravelly sandy loam. They formed in alluvium on the lower stream terraces on the Piedmont and the Coastal Plain. Slopes are 0 to 2 percent.

Bolling Variant soils are commonly near Tarboro, Dawhoo Variant, Forestdale, and Fork soils. They have more pebbles in the solum than the Tarboro soils and are not as excessively drained. They are not as poorly drained as the Dawhoo Variant, Forestdale, or Fork soils.

Typical pedon of Bolling Variant gravelly sandy loam, about 200 feet west of the end of Route 728, about 1,000 feet south of the Pamunkey River:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, brown (10YR 5/3) dry; weak fine granular structure; very friable, nonsticky and nonplastic; 25 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 1 percent quartz cobblestones; few fine mica flakes; medium acid; abrupt smooth boundary.

B2t—11 to 26 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam; few fine faint pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; very friable, slightly sticky and slightly plastic; clay coatings on sand grains; common bridging; 55 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 3 percent quartz cobblestones; few fine mica flakes; medium acid; gradual smooth boundary.

B3—26 to 35 inches; dark brown (7.5YR 4/4) and pale brown (10YR 6/3) very gravelly sandy loam; single grain; very friable, nonsticky and nonplastic; 60 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 5 percent quartz cobble-

stones; few fine mica flakes; medium acid; gradual smooth boundary.

C1—35 to 58 inches; pale brown (10YR 6/3) sand and gravel; single grain; loose; very friable; slightly acid; gradual smooth boundary.

C2—58 to 64 inches; grayish brown (10YR 5/2) gravelly sandy clay loam; massive; friable; strongly acid.

The Bolling Variant soils have a mollic epipedon, and they are more than 35 percent pebbles in the argillic horizon.

The solum is 32 to 48 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 20 to 35 percent of the A horizon and 35 to 65 percent of the B horizon. Cobblestones make up 0 to 5 percent of the solum. A few boulders, as much as 1 meter in diameter, are in the solum and substratum in many pedons.

The A horizon has hue of 10YR, value of 3 or less, and chroma of 2 or 3. It is gravelly or very gravelly sandy loam.

The B horizon has hue of 10YR, 7.5YR, and 2.5Y; value of 4 through 6; and chroma of 3 through 6. The range in texture includes very gravelly sandy clay loam and gravelly sandy loam.

The C horizon has hue of 7.5YR or 10YR, value of 4 through 7, and chroma of 2 through 8.

Bourne series

Soils of the Bourne series are fine-loamy, mixed, thermic Typic Fragiudults. They are deep, moderately well drained soils that have a subsoil that consists of mostly yellowish brown sandy clay loam and sandy loam to a depth of about 24 inches and a fragipan below that depth. These soils formed in loamy, fluviomarine sediments. They are on broad ridgetops and side slopes on the Coastal Plain and the eastern edge of the Piedmont. Slopes range from 2 to 15 percent.

Bourne soils are commonly near Colfax, Duplin, Goldsboro, and Kempsville soils. They are better drained than the Colfax soils. Unlike the Duplin, Goldsboro, and Kempsville soils, they have a fragipan. Bourne soils have less clay than the Duplin soils.

Typical pedon of Bourne fine sandy loam, 2 to 7 percent slopes, in a stand of pine about one-fourth mile north of Route 696, 50 feet northeast of entrance to Beechwood Estates, one-half mile northeast of the junction of Routes 696 and 666:

A1—0 to 2 inches; grayish brown (2.5Y 5/2) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine and medium roots; many fine and medium pores; extremely acid; abrupt smooth boundary.

A2—2 to 13 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B2t—13 to 24 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine and medium pores; thin patchy clay films; very strongly acid; clear wavy boundary.

Bx1—24 to 35 inches; light yellowish brown (2.5Y 6/4) sandy loam; many coarse distinct yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; weak thick platy structure; firm, brittle and compact, slightly sticky and nonplastic; common fine and medium vesicular pores; few thin patchy clay films; very strongly acid; gradual smooth boundary.

Bx2—35 to 68 inches; light brownish gray (10YR 6/2) sandy loam; many coarse distinct yellowish brown (10YR 5/4 and 5/6) and strong brown (7.5Y 5/6) mottles; weak, very thick platy structure; firm, brittle and compact, slightly sticky and nonplastic; common fine and medium vesicular pores; thin patchy clay films; very strongly acid; abrupt wavy boundary.

IICg—68 to 76 inches; white (10YR 8/1) clay; common medium distinct brownish yellow (10YR 6/6) mottles; massive; very firm, very sticky and very plastic; very strongly acid.

The solum is commonly 40 to 70 inches thick.

The A horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 2 through 4.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 4 through 6. It is sandy clay loam or clay loam. The Bx horizon has hue of 10YR, 2.5Y, and 7.5YR; value of 5 and 6; and chroma of 1 through 6. It is brittle and compact in more than 50 percent of its mass. It is sandy loam or sandy clay loam.

The C horizon ranges from sandy loam to clay. In some pedons the C horizon consists of residuum of weathered Piedmont rock.

Caroline series

Soils of the Caroline series are clayey, mixed, thermic, Typic Paleudults. They are deep, well drained soils that have a thick subsoil that is mostly yellowish red clay and is mottled below a depth of about 19 inches. These soils formed in loamy and clayey, fluviomarine sediments. They are on narrow to somewhat broad ridgetops and side slopes on the Coastal Plain. Slopes range from about 2 to 25 percent but are dominantly 2 to 15 percent.

In this survey area, the Caroline soils classify as clayey, mixed, thermic Typic Hapludults. They are a taxadjunct to the Caroline series because they have a greater increase in content of clay with depth than is typical. This difference does not alter the use and behavior of these soils.

Caroline soils are commonly near Altee, Dogue, Duplin, Faceville, and Norfolk soils. They are better

drained than the Altee, Dogue, and Duplin soils, and they have more clay than the Altee soils. They are less red and more mottled in the lower part of the argillic horizon than the Faceville soils. They have more clay than the Norfolk soils.

Typical pedon of Caroline fine sandy loam, 2 to 7 percent slopes, 600 feet west of Route 628, one-third mile north of the junction of Routes 628 and 616:

A1—0 to 2 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine and medium pores; very strongly acid; clear smooth boundary.

A2—2 to 8 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; common fine and medium pores; strongly acid; clear smooth boundary.

B21t—8 to 12 inches; strong brown (7.5YR 5/6) heavy clay loam; weak fine subangular blocky structure; friable, sticky and plastic; common fine and medium and few coarse roots; common fine and medium pores; thin patchy clay films; very strongly acid; clear smooth boundary.

B22t—12 to 19 inches; yellowish red (5YR 4/8) clay; few fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium and few coarse roots; few fine pores; thin continuous clay films; few fine dark red (2.5YR 3/6) nodules; 2 percent rounded quartz pebbles, that are as much as 50 millimeters in diameter; very strongly acid; gradual smooth boundary.

B23t—19 to 34 inches; yellowish red (5YR 4/8) clay; common medium distinct brownish yellow (10YR 6/8), dark red (2.5YR 3/6), and red (2.5YR 4/8) mottles; few fine prominent light gray (5YR 7/1) mottles below a depth of 26 inches; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; few fine pores; thin continuous clay films; very strongly acid; gradual smooth boundary.

B24t—34 to 46 inches; mottled yellowish red (5YR 5/8), yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), light gray (10YR 7/1), dark red (2.5YR 3/6), and red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; thin continuous clay films; very strongly acid; gradual smooth boundary.

B25t—46 to 78 inches; mottled brownish yellow (10YR 6/8), light gray (10YR 7/1), yellowish red (5YR 5/8), and red (2.5YR 4/8) clay; moderate medium angular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin layers of clay loam; thick discontinuous clay films; very strongly acid.

The solum is commonly more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 50 millimeters in diameter, make up 0 to 10 percent of the solum.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 2 through 6.

The Bt horizon in the upper part has hue of 7.5YR and 5YR, value of 4 and 5, and chroma of 6 through 8. In this part, high-chroma mottles occur throughout, and a few mottles that have chroma of 1 or 2 occur below a depth of about 26 inches. In the lower part the Bt horizon is mottled in hue of 2.5YR through 10YR, value of 4 through 7, and chroma of 1 through 8. The Bt horizon ranges to clay loam and sandy clay. In many pedons, there are thin layers of clay loam in the lower part, below a depth of about 48 inches.

Cecil series

Soils of the Cecil series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly red clay. These soils formed in material that weathered from granite and gneiss. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 25 percent, but they are dominantly 2 to 17 percent.

Cecil soils are commonly near Appling, Cullen, Pacolet, Spotsylvania, Vance, and Wedowee soils. They have a redder subsoil than the Appling, Spotsylvania, Vance, and Wedowee soils but not the dark red subsoil of the Cullen soils. They have a thicker clay subsoil than the Pacolet soils. They do not have the very firm subsoil of the Vance soils.

Typical pedon of Cecil fine sandy loam, 2 to 7 percent slopes, eroded, in a wooded area, 800 feet east of Route 708 and 3,000 feet south of the junction of Routes 708 and 631:

A1—0 to 2 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; 1 percent angular quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; abrupt smooth boundary.

A2—2 to 5 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common fine roots; common fine pores; 1 percent angular quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; clear smooth boundary.

B1t—5 to 9 inches; yellowish red (5YR 4/8) loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine pores; 1 percent angular quartz pebbles that are as much as 30 millimeters in diameter; few fine mica flakes; very strongly acid; clear smooth boundary.

B21t—9 to 16 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine pores; thin con-

tinuous clay films; 1 percent angular quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; very strongly acid; gradual smooth boundary.

B22t—16 to 44 inches; red (2.5YR 4/6) clay; moderate medium angular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; 1 percent angular quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; strongly acid; gradual smooth boundary.

B3t—44 to 53 inches; red (2.5YR 4/6) clay loam; few fine distinct strong brown (7.5YR 5/8) and light yellowish brown (10YR 6/4) mottles; weak medium angular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; thin continuous clay films; 10 percent angular quartz pebbles, as much as 50 millimeters in diameter, in veins; many fine mica flakes; strongly acid; gradual smooth boundary.

C—53 to 60 inches; red (2.5YR 4/6) clay loam; common medium distinct strong brown (7.5YR 5/8) mottles and streaks; massive; friable, slightly sticky and slightly plastic; 5 percent angular quartz pebbles, as much as 50 millimeters in diameter, in veins; many fine mica flakes; strongly acid.

The solum is more than 40 inches thick. Bedrock is at a depth of more than 5 feet. Angular and subangular quartz pebbles that are as much as 75 millimeters in diameter make up 0 to about 25 percent of the A horizon, 0 to about 10 percent of the B2 horizon, and about 1 percent to 15 percent of the B3 horizon and the C horizon.

The A horizon has hue of 10YR, 7.5YR, or 5YR; value of 4 or 5; and chroma of 2 through 6. It is fine sandy loam or gravelly sandy loam.

The Bt horizon has hue of 2.5YR and 10R and value of 4 or 5. High-chroma mottles are common in the lower part.

The C horizon ranges from clay loam to loam.

Chewacla series

Soils of the Chewacla series are fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts. They are deep, somewhat poorly drained soils that have a subsoil that is mostly brown loam in the upper part and gray sandy loam in the lower part. These soils formed in alluvium and are on flood plains along streams on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Chewacla soils are commonly near Altavista, Augusta, and Wehadkee soils. They do not have the argillic horizon of the Altavista and Augusta soils. They are more poorly drained than the Altavista soils but not as poorly drained as the Wehadkee soils.

Typical pedon of Chewacla fine sandy loam at the site of Hanover School for Boys, about 1,000 feet south of the Pamunkey River and 4,300 feet east of cemetery:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine roots; few fine pores; patchy silt coatings; common fine mica flakes; strongly acid; gradual smooth boundary.

B1—9 to 18 inches; dark brown (10YR 4/3) loam; common fine faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; thin patchy silt coatings; common fine mica flakes; slightly acid; gradual smooth boundary.

B2—18 to 34 inches; brown (10YR 4/3) loam; many medium and coarse distinct gray (10YR 6/1) and brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; common fine mica flakes; strongly acid; gradual smooth boundary.

B3g—34 to 42 inches; gray (10YR 6/1) sandy loam; many medium and coarse distinct dark yellowish brown (10YR 4/4) and very dark grayish brown (10YR 3/2) mottles; massive; friable, slightly sticky and slightly plastic; few fine and medium pores; common fine black mineral grains; common fine mica flakes; strongly acid; gradual wavy boundary.

Cg—42 to 60 inches; gray (10YR 6/1) sandy loam; common medium distinct brown (10YR 4/4) and strong brown (7.5YR 5/6) mottles; massive; friable, slightly sticky and slightly plastic; common fine mica flakes; strongly acid.

The solum is 36 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has value of 4 and 5 and chroma of 2 through 4.

The B horizon has hue of 10YR, 7.5YR, and 5YR; value of 4 through 6; and chroma of 1 through 6. The range in texture includes sandy loam, fine sandy loam, loam, clay loam, and silty clay loam.

The C horizon has hue of 10YR and 2.5Y, value of 5 and 6, and chroma of 1 and 2. It commonly has high-chroma mottles. It ranges from sand and loamy sand to sandy loam and loam. In some pedons, the C horizon contains thin layers of gravel.

Colfax series

Soils of the Colfax series are fine-loamy, mixed, thermic Aquic Fragiudults. They are deep, somewhat poorly drained to moderately well drained soils that have a subsoil that consists of mostly light olive brown sandy clay loam to a depth of about 24 inches and a fragipan below that depth. These soils formed in alluvium that washed from the surrounding soils. They are in shallow depressions and on toe slopes. Slopes range from about 2 to 15 percent, but the range is dominantly 2 to 7 percent.

Colfax soils are commonly near Appling, Cecil, Helena, Orange, Vance, and Worsham soils. Unlike these soils, Colfax soils have a fragipan. Colfax soils are less well drained than the Appling, Cecil, Helena, and Vance soils and better drained than the Worsham soils.

Typical pedon of Colfax fine sandy loam, 2 to 7 percent slopes, about 1 mile east of the junction of Routes 715 and 658, about 800 feet south of Route 715, near Green Bay:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak very fine granular structure; very friable, slightly sticky and nonplastic; many fine and medium roots; many fine pores; very strongly acid; clear smooth boundary.

A2—2 to 8 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; common fine roots; few fine and medium pores; very strongly acid; clear smooth boundary.

B1—8 to 12 inches; light olive brown (2.5Y 5/4) fine sandy loam; common fine faint light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine pores; very strongly acid; clear wavy boundary.

B2t—12 to 24 inches; light olive brown (2.5Y 5/4) sandy clay loam; few fine faint light grayish brown (2.5Y 6/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine pores; thin patchy clay films; very strongly acid; clear wavy boundary.

Bx1—24 to 46 inches; gray (10YR 6/1), light yellowish brown (2.5Y 6/4), and strong brown (7.5YR 5/6) fine sandy loam; moderate thick platy structure; very firm, brittle and compact in place, slightly sticky and slightly plastic; few fine roots in upper 6 inches; few fine and medium vesicular pores; few vertical seams of gray (10YR 6/1) clay loam, 1/8- to 1-inch thick; very strongly acid; clear irregular boundary.

Bx2—46 to 60 inches; light gray (2.5Y 7/2) sandy loam; common medium faint olive yellow (2.5Y 6/6) mottles; moderate thick platy structure; very firm, brittle and compact, nonsticky and nonplastic; few fine angular quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid.

The solum is commonly 40 to 60 or more inches thick. Bedrock is at a depth of more than 5 feet. Rounded to angular quartz pebbles make up 0 to 10 percent of the solum.

The A horizon ranges from fine sandy loam to heavy silt loam.

The Bx horizon has hue of 10YR, 2.5Y, and 7.5YR; value of 5 through 8; and chroma of 1 through 7. It is brittle and compact in more than 60 percent of its mass. It is sandy loam, loam, or clay loam.

Coxville series

Soils of the Coxville series are clayey, kaolinitic, thermic Typic Paleaquults. They are deep, poorly drained soils that have a thick subsoil that is mostly gray clay. These soils formed in clayey, fluviomarine sediments. They are on broad upland flats on the Coastal Plain. Slopes range from 0 to 2 percent.

Coxville soils are commonly near Atlee, Dunbar, and Lenoir soils. They are more poorly drained than all these soils, and they have more clay than the Atlee soils.

Typical pedon of Coxville loam, three-fourths of a mile east of Brown Grove Baptist Church, 500 feet southwest of the junction of Routes 657 and 656:

A11—0 to 4 inches; dark gray (5Y 4/1) loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium and few coarse roots; very strongly acid; clear wavy boundary.

A12—4 to 7 inches; gray (5Y 6/1) loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine medium and coarse roots; few fine pores; very strongly acid; clear smooth boundary.

A2g—7 to 12 inches; gray (5Y 6/1) loam; weak fine subangular blocky and weak fine granular structure; friable, slightly sticky and slightly plastic; few fine to coarse roots; few fine pores; extremely acid; clear smooth boundary.

B1tg—12 to 19 inches; gray (5Y 6/1) clay loam; common medium prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, sticky and plastic; few fine and medium roots; few fine pores; thin patchy clay films; very strongly acid; gradual smooth boundary.

B21tg—19 to 40 inches; gray (N 5/0) clay; common coarse prominent yellowish red (5YR 4/8), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine and medium roots; thin continuous clay films; 1 percent rounded quartz pebbles that are as much as 10 millimeters in diameter; very strongly acid; gradual smooth boundary.

B22tg—40 to 67 inches; gray (N 5/0) clay; common coarse prominent red (2.5YR 4/8), yellowish red (5YR 4/8), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/8) mottles; strong medium angular blocky structure; firm, sticky and plastic; few fine roots; thick continuous clay films; 1 percent rounded quartz pebbles that are as much as 10 millimeters in diameter; very strongly acid; gradual smooth boundary.

B23tg—67 to 82 inches; gray (N 5/0) clay; few coarse prominent strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; very firm, sticky and plastic; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 5Y to 10YR or is neutral. It has value of 4 through 6 and chroma of 0 or 1.

The Bt horizon has hue of 5Y or is neutral. It has value of 4 through 6, and chroma of 0 and 1. High-chroma mottles are common throughout the Bt horizon.

Creedmoor series

Soils of the Creedmoor series are clayey, mixed, thermic Aquic Hapludults. They are deep, moderately well drained soils that have a subsoil that is dominantly yellowish brown and gray clay. These soils formed in material that weathered from sandstone and shale. They are on ridgetops and the upper part of side slopes on the Piedmont. Slopes range from 2 to 7 percent.

Creedmoor soils are commonly near Bourne, Colfax, Edgehill Variant, Mayodan, Pinkston, and Worsham soils. Unlike the Bourne and Colfax soils they do not have a fragipan. They have more clay than the Edgehill Variant soils and do not have the gravelly textures of the Edgehill Variant soils. They are less well drained than the Mayodan soils and are more sticky and plastic in the argillic horizon. They have more clay and are less well drained than the Pinkston soils. They are better drained than the Worsham soils.

Typical pedon of Creedmoor fine sandy loam, 2 to 7 percent slopes, 200 feet northwest of the junction of Routes 786 and 54:

A1—0 to 3 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine medium and coarse roots; common fine and medium pores; medium acid; clear smooth boundary.

A2—3 to 11 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; friable, nonsticky and nonplastic; few fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B1t—11 to 16 inches; yellowish brown (10YR 5/8) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; few fine and medium pores; thin patchy clay films; very strongly acid; clear smooth boundary.

B21t—16 to 21 inches; yellowish brown (10YR 5/8) clay loam; moderate medium subangular blocky structure; firm, sticky and plastic; common fine, medium, and coarse roots; few fine pores; thin patchy clay films; very strongly acid; clear smooth boundary.

B22t—21 to 33 inches; light yellowish brown (10YR 6/4) clay; many medium distinct gray (10YR 6/1), yellowish brown (10YR 5/6), and brown (10YR 5/3) mottles; strong medium angular blocky structure; very firm, very sticky and very plastic; common fine and medium roots; thick continuous clay films; extremely acid; gradual smooth boundary.

B23tg—33 to 39 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6), reddish brown (5YR 5/3), and yellowish red (5YR 4/6) mottles; strong coarse angular blocky structure; very firm, very sticky and very plastic; few fine roots; thick continuous clay films; extremely acid; gradual wavy boundary.

C1g—39 to 58 inches; gray (10YR 6/1) sandy clay; many coarse distinct yellowish brown (10YR 5/4) streaks and mottles; massive; firm, sticky and plastic; few fine and medium pores; common fine mica flakes; very strongly acid; clear wavy boundary.

C2—58 to 88 inches; gray (10YR 6/1), pale brown (10YR 6/3), light olive brown (2.5Y 5/4), and brown (7.5YR 4/4) weathered arkosic sandstone that crushes easily to sandy loam; massive; firm, slightly sticky and slightly plastic; many fine mica flakes; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 6, and chroma of 1 through 4.

The Bt horizon in the upper part has hue of 10YR and 7.5YR, value of 5 and 6, and chroma of 4 through 8. Low-chroma mottles are common in this part below a depth of about 21 inches. The Bt horizon in the lower part has value of 5 and 6 and chroma of 1 and 2. It commonly has high-chroma mottles.

The C horizon ranges from sandy loam to clay loam or sandy clay.

Creedmoor Variant

The Creedmoor Variant soils are clayey, mixed, thermic Aeric Ochraquults. They are deep, somewhat poorly drained soils that have a subsoil that is dominantly gray clay. These soils formed in material that weathered from sandstone, mudstone, siltstone, and shale. They are in small depressions, along drainageways, and on toe slopes on the Piedmont. Slopes range from 2 to 7 percent.

Creedmoor Variant soils are commonly near Colfax, Mayodan, Pinkston, and Worsham soils. Unlike the Colfax soils, they do not have a fragipan. They are not as well drained as the Mayodan soils and are more sticky and plastic in the argillic horizon. They have more clay and are not as well drained as the Pinkston soils. They are better drained than the Worsham soils.

Typical pedon of Creedmoor Variant fine sandy loam, 2 to 7 percent slopes, about 1,800 feet south of Little River, 1 1/8 miles west of U.S. 1, one-half mile north of Route 690:

A1—0 to 3 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine and medium roots; few fine pores; very strongly acid; abrupt smooth boundary.

A2—3 to 10 inches; pale brown (10YR 6/3) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) and gray (10YR 6/1) mottles; moderate fine granular structure; friable, slightly sticky and nonplastic; common fine and medium roots; few fine pores; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; very strongly acid; clear smooth boundary.

B1t—10 to 16 inches; yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) clay loam; common fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and medium roots; few fine pores; thin discontinuous clay films; extremely acid; clear smooth boundary.

B21tg—16 to 34 inches; gray (5Y 5/1) clay; common coarse prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few fine roots; medium continuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

B22tg—34 to 46 inches; gray (N 6/0) clay; common coarse prominent yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/8) and reddish brown (5YR 5/4) mottles; moderate coarse subangular blocky structure; very firm, very sticky and very plastic; few fine roots; thick continuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

B3tg—46 to 55 inches; gray (N 6/0) clay; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; few fine roots; few fine mica flakes; thick continuous clay films; very strongly acid; gradual smooth boundary.

Cg—55 to 92 inches; gray (N 6/0) clay; few medium prominent yellowish brown (10YR 5/8) mottles; massive; very firm, sticky and very plastic; few fine mica flakes; few fine and medium weathered feldspar crystals; very strongly acid.

The solum is 35 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR or 2.5Y or is neutral. It has value of 3 through 6 and chroma of 0 through 4.

The B1 horizon has hue of 10YR and 2.5Y, value of 5 or 6, and chroma of 4 through 8. In some pedons, the B1 horizon has low-chroma mottles. It is clay loam or sandy clay loam. The B2t horizon has hue of 10YR to 5Y or is neutral. It has value of 4 through 7. It commonly has high-chroma mottles. The B3t horizon is clay or sandy clay loam.

The C horizon ranges from clay to sandy loam.

Cullen series

Soils of the Cullen series are clayey, mixed, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mainly red and dark red clay. These soils formed in material that weathered from granite-gneiss and hornblende gneiss. They are on ridgetops and side slopes along the eastern edge of the Piedmont. Slopes range from 2 to 25 percent.

In this survey area, the Cullen soils classify as clayey, oxidic, thermic Typic Hapludults. They are a taxadjunct to the Cullen series because the ratio of percent extractable iron oxide plus percent gibbsite to percent clay is slightly higher than is typical. This difference does not alter the use and behavior of these soils.

Cullen soils are commonly near Cecil, Faceville, and Pacolet soils. They are dark red in the lower part of the argillic horizon, unlike the Cecil, Faceville, and Pacolet soils. They have a thinner solum than the Faceville soils and a thicker solum than the Pacolet soils.

Typical pedon of Cullen loam, 2 to 7 percent slopes, eroded, about one-half mile north of Montpelier, in a fresh roadcut on the east side of Route 715:

Ap—0 to 8 inches; dark brown (7.5YR 4/4) loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; abrupt smooth boundary.

B21t—8 to 18 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; thin continuous clay films; 2 percent angular quartz pebbles that are as much as 50 millimeters in diameter; neutral; gradual smooth boundary.

B22t—18 to 32 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; moderately thick continuous clay films; common fine mica flakes; very strongly acid; gradual smooth boundary.

B23t—32 to 58 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; moderately thick continuous clay films; common fine mica flakes; very strongly acid; gradual wavy boundary.

C—58 to 120 inches; dark red (10R 3/6), red (2.5YR 4/6), and white (N 8/0) weathered hornblende gneiss that crushes to loam; massive; friable, slightly sticky and slightly plastic; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet. In some pedons, angular quartz pebbles, as much as 50 millimeters in diameter, make up 1 to 5 percent of one or more of the B horizons.

The A horizon has hue of 7.5YR and 5YR, value of 4 and 5, and chroma of 4 through 6.

The Bt horizon has hue of 2.5YR and 10R, value of 3 and 4, and chroma of 6 through 8.

Dawhoo Variant

The Dawhoo Variant soils are sandy, siliceous, thermic Typic Humaquepts. They are deep, very poorly drained

soils that have a substratum consisting mostly of dark gray and dark greenish gray gravelly loamy sand and sandy clay loam. These soils formed in alluvium in old stream channels, in oxbow lakes, and in depressions in low-lying terraces along the larger streams in the eastern part of the Piedmont and on the Coastal Plain. Slopes range from 0 to 2 percent.

Dawhoo Variant soils are commonly near Augusta, Tarboro, Forestdale, Fork, Roanoke, and Wahee soils. Dawhoo Variant soils are more poorly drained than these soils. They have less clay than the Augusta, Forestdale, Fork, Roanoke, and Wahee soils and do not have an argillic horizon, which these soils have.

Typical pedon of Dawhoo Variant fine sandy loam, 50 feet west of U.S. 360, 1 1/4 miles south of the bridge over the Pamunkey River:

Ap—0 to 11 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable, slightly sticky and nonplastic; many fine roots; 8 percent rounded and subrounded quartz pebbles that are as much as 75 millimeters in diameter; medium acid; gradual smooth boundary.

A1—11 to 20 inches; black (10YR 2/1) gravelly loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; 20 percent rounded and subrounded quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; slightly acid; gradual smooth boundary.

C1—20 to 36 inches; dark gray (5Y 4/1) gravelly loamy sand; single grain; loose, nonsticky and nonplastic; 20 percent rounded and subrounded quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; neutral; gradual smooth boundary.

C2—36 to 50 inches; dark gray (5Y 4/1) gravelly loamy sand; common medium and coarse distinct light olive brown (2.5Y 5/6) mottles; single grain; loose, nonsticky and nonplastic; 40 percent rounded and subrounded quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; neutral; gradual smooth boundary.

C3—50 to 63 inches; dark greenish gray (5GY 4/1) sandy clay loam; many medium faint greenish gray (5GY 5/1) and many medium distinct olive (5Y 4/4) mottles; massive; friable, slightly sticky and slightly plastic; 3 percent rounded and subrounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; neutral.

Bedrock is at a depth of more than 5 feet. Rounded and subrounded quartz pebbles make up 5 to 20 percent of the A horizon. They make up 15 to 45 percent of the C horizon above a depth of about 50 inches and 1 to 20 percent below that depth.

The A horizon has chroma of 1 and 2.

The C horizon above a depth of about 50 inches has hue of 5Y, 2.5Y, and 10YR and value of 4 and 5. Below that depth, it has hue of 5GY and 5Y and value of 4 and 5. The C horizon ranges from sandy clay loam to loamy sand and sandy loam. In some pedons, the C horizon has mottles with chroma of 4 to 8.

Dogue series

Soils of the Dogue series are clayey, mixed, thermic Aquic Hapludults. They are deep, moderately well drained soils that have a subsoil that consists mostly of strong brown and yellowish brown clay and is mottled gray below a depth of about 21 inches. These soils formed in alluvium and fluviomarine sediments. They are on broad ridgetops, on ridges and side slopes, and in low-lying areas on the Coastal Plain. Slopes are 0 to 15 percent.

Dogue soils are commonly near Altavista, Augusta, Caroline, Faceville, Fork, and Masada soils. They have more clay than the Altavista, Augusta, and Fork soils. They are not as poorly drained as the Augusta and Fork soils, and they are not as well drained as the Caroline, Faceville, and Masada soils.

Typical pedon of Dogue loam, at site of Hanover Courthouse, by waterline ditch, 60 feet south of Post Office, 50 feet east of U.S. 301:

Ap—0 to 11 inches; dark grayish brown (2.5Y 4/2) loam; weak fine granular structure; friable, slightly sticky and slightly plastic, few fine roots; few fine and medium pores; neutral; abrupt smooth boundary.

B21t—11 to 21 inches; strong brown (7.5YR 5/6) clay; common medium and fine distinct yellowish red (5YR 4/6) mottles; strong medium angular blocky structure; firm, sticky and plastic; few fine roots; thick continuous clay films; very strongly acid; clear smooth boundary.

B22t—21 to 35 inches; mottled yellowish brown (10YR 5/4), yellowish red (5YR 4/6), strong brown (7.5YR 5/6), and gray (N 6/0) clay; strong medium angular blocky structure; firm, sticky and plastic; few fine roots; thick continuous clay films; very strongly acid; gradual smooth boundary.

B3t—35 to 51 inches; mottled strong brown (7.5YR 5/6), yellowish red (5YR 4/6), yellowish brown (10YR 5/4), weak red (2.5YR 4/2), and gray (N 6/0) clay; moderate coarse angular blocky structure; firm, sticky and plastic; thick continuous clay films; few fine mica flakes; pockets of strong brown (7.5YR 5/6) sandy clay loam that are as much as 2 inches in diameter; very strongly acid; clear wavy boundary.

C1—51 to 70 inches; mottled strong brown (7.5YR 5/6), yellowish brown (10YR 5/4), brown (7.5YR 4/4), weak red (2.5YR 4/2), and gray (N 6/0) sandy clay loam and clay; massive; friable, sticky and plastic; common fine mica flakes; strongly acid; gradual smooth boundary.

C2—70 to 99 inches; strong brown (7.5YR 5/6) sandy loam; massive; friable, slightly sticky and slightly plastic; 1 percent rounded quartz pebbles that are

as much as 25 millimeters in diameter; common fine mica flakes; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 2.5Y and 10YR, value of 4 through 6, and chroma of 2 through 4.

The Bt horizon has hue of 7.5YR and 10YR, value of 4 through 6, and chroma of 4 through 8. It commonly has high-chroma mottles throughout and low-chroma mottles below a depth of about 21 inches. It is clay or clay loam.

Dunbar series

Soils of the Dunbar series are clayey, kaolinitic, thermic Aeric Paleaquults. They are deep, somewhat poorly drained soils that have a subsoil that is commonly thick and consists mostly of gray clay. These soils formed in clayey, fluviomarine sediments. They are in broad, commonly slightly concave low-lying areas on the Coastal Plain. Slopes are mostly 0 to 2 percent.

Dunbar soils are commonly near Atlee, Bourne, Coxville, Duplin, and Lenoir soils. They are more poorly drained than the Atlee, Bourne, and Duplin soils, have more clay than the Atlee and Bourne soils, and, unlike the Bourne soils, do not have a fragipan. They are not as poorly drained as the Coxville soils. They have less silt than the Lenoir soils.

Typical pedon of Dunbar fine sandy loam, 300 feet east of Route 54, 25 feet north of buried gasoline pipeline, and 150 feet south of Ashland Convalescent Hospital:

Ap—0 to 10 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; 1 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; slightly acid; abrupt smooth boundary.

B21t—10 to 17 inches; mottled yellowish brown (10YR 5/6), olive (5Y 5/4), light brownish gray (2.5Y 6/2), and strong brown (7.5YR 5/8) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common fine roots; common fine pores; thin discontinuous clay films; very strongly acid; gradual smooth boundary.

B22tg—17 to 38 inches; gray (N 5/0) clay; common medium and coarse prominent strong brown (7.5YR 5/8), yellowish red (5YR 4/8), and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium pores; thin discontinuous clay films; very strongly acid; gradual smooth boundary.

B23tg—38 to 65 inches; gray (N 5/0) clay; common coarse prominent yellowish red (5YR 4/8), strong brown (7.5YR 4/8), and yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to weak coarse subangular blocky; firm, sticky and plastic; thin continuous clay films; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 1 or 2.

The Bt horizon has hue of 5Y, 2.5Y, and 10YR or it is neutral. It has value of 4 through 6 and chroma of 0 and 1. It contains high-chroma mottles throughout. It is clay, clay loam, or sandy clay.

Duplin series

Soils of the Duplin series are clayey, kaolinitic, thermic Aquic Paleudults. They are deep, moderately well drained soils that have a thick subsoil consisting mostly of yellowish brown and olive gray sandy clay and clay. These soils formed in clayey, fluviomarine sediments. They are on broad, slightly convex ridgetops and broad slightly concave upland flats on the Coastal Plain. Slopes range from 0 to 7 percent.

Duplin soils are commonly near Bourne, Caroline, Dunbar, Faceville, Norfolk, and Lenoir soils. Unlike the Bourne soils, they do not have a fragipan. They are less well drained than the Caroline, Faceville, and Norfolk soils and have more clay than the Norfolk soils. They are not as poorly drained as the Dunbar and Lenoir soils.

Typical pedon of Duplin fine sandy loam, 2 to 7 percent slopes, 3,300 feet northeast of the junction of Routes 798 and 54, 500 feet north of old sawmill road:

A1—0 to 4 inches; olive gray (5Y 4/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine medium and coarse roots; common fine and medium pores; very strongly acid; clear smooth boundary.

A2—4 to 9 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine medium and coarse roots; common fine and medium pores; 1 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; clear smooth boundary.

B1t—9 to 12 inches; light olive brown (2.5Y 5/4) clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; few fine and medium pores; few thin clay films; very strongly acid; clear smooth boundary.

B21t—12 to 22 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine medium pores; thin discontinuous clay films; 1 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; clear smooth boundary.

B22t—22 to 43 inches; yellowish brown (10YR 5/6) sandy clay; many coarse distinct gray (10YR 5/1) and common coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky

structure; firm, sticky and plastic; few fine roots; few fine and medium pores; thin discontinuous clay films; 5 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; clear smooth boundary.

B23tg—43 to 72 inches; olive gray (5Y 5/2) clay; many medium and coarse prominent strong brown (7.5YR 5/6), yellowish red (5YR 4/8), and yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine and medium pores; thin patchy clay films; 5 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, 4 to 50 millimeters in diameter, make up 0 to about 5 percent of the solum. Low-chroma mottles are in the upper 24 inches of the profile.

The A horizon has hue of 5Y, 2.5Y, and 10YR; value of 4 through 6; and chroma of 1 through 4.

The Bt horizon in the upper part has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 4 through 8. The Bt horizon in the lower part has hue of 5Y, 2.5Y, and 10YR; value of 4 through 6; and chroma of 1 and 2. High-chroma mottles are in the lower part of the Bt horizon.

Edgehill Variant

The Edgehill Variant soils are loamy-skeletal, mixed, thermic Typic Hapludults. They are deep, well drained soils that have a thick subsoil consisting mostly of strong brown and red very gravelly sandy clay loam. These soils formed in very gravelly fluviomarine sediments, and they are on narrow to somewhat broad ridgetops and on side slopes on the eastern part of the Piedmont. Slopes are about 2 to 25 percent.

Edgehill Variant soils are commonly near Appling, Creedmoor, Mayodan, and Pinkston soils. They have more pebbles throughout the solum than these soils. They have less clay than the Appling, Creedmoor, and Mayodan soils, and they have a thicker solum than the Pinkston soils.

Typical pedon of Edgehill Variant very gravelly sandy loam, 2 to 7 percent slopes, in a roadbank by Route 667, about 700 feet south of the junction of Routes 667 and 641:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) very gravelly sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium pores; 50 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent rounded quartz cobblestones; very strongly acid; abrupt smooth boundary.

A2—2 to 18 inches; olive (5Y 5/3) very gravelly sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; 50 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent rounded quartz cobblestones; very strongly acid; clear smooth boundary.

B21t—18 to 38 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam; weak fine subangular blocky structure; friable, sticky and plastic; few fine roots; common fine and medium pores; thin patchy clay films; thin continuous clay coatings on surfaces of pebbles; 65 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent rounded quartz cobblestones; strongly acid; gradual wavy boundary.

B22t—38 to 64 inches; red (2.5YR 4/6) very gravelly sandy clay loam; weak fine subangular blocky structure; friable, sticky and plastic; few fine and medium pores; thin patchy clay films; thin continuous clay coatings on surfaces of pebbles; 50 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent rounded quartz cobblestones; strongly acid.

The solum ranges in thickness from 48 to more than 60 inches. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 50 to 75 percent of the solum. Rounded quartz cobblestones make up from 0 to 5 percent of the solum.

The A horizon has hue of 10YR, 2.5Y, and 5Y; value of 3 through 6; and chroma of 2 through 4.

The Bt horizon has hue of 10YR through 2.5YR, value of 4 through 6, and chroma of 6 through 8.

In some pedons, there is a C horizon, which ranges from sand and gravel to weathered sandstone, shale, granite, and gneiss.

Faceville series

Soils of the Faceville series are clayey, kaolinitic, thermic Typic Paleudults. They are deep, well drained soils that have a thick subsoil consisting mostly of yellowish red and red clay loam and clay. These soils formed in loamy and clayey fluviomarine sediments. The Faceville soils are on broad ridgetops and on side slopes on the Coastal Plain. Slopes range from 0 to 15 percent but are dominantly 2 to 7 percent.

Faceville soils are commonly near Caroline, Duplin, Orangeburg, and Kempsville soils. They have a redder argillic horizon than the Caroline soils, and they are better drained than the Duplin soils. They have more clay than the Orangeburg and Kempsville soils. In this survey area, Faceville soils are mapped only in complex with Orangeburg soils.

Typical pedon of Faceville fine sandy loam, in an area of Orangeburg-Faceville fine sandy loams, 2 to 7 percent

slopes, 900 feet northeast of the junction of Routes 627 and 638, 20 feet northwest of Route 627, near Carneals Store:

Ap—0 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; medium acid; clear smooth boundary.

B1t—10 to 17 inches; yellowish red (5YR 5/8) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; common fine pores; thin patchy clay films; very strongly acid; gradual smooth boundary.

B21t—17 to 37 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine and medium pores; thin continuous clay films; very strongly acid; gradual smooth boundary.

B22t—37 to 70 inches; red (10R 4/8) clay; few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine and medium pores; thin continuous clay films; very strongly acid.

The solum is more than 60 inches thick.

The A horizon has color value of 4 through 6 and chroma of 2 through 4.

The B1 horizon has hue of 5YR and 7.5YR, value of 4 and 5, and chroma of 6 through 8. The B2 horizon has hue of 10R or 2.5YR, value of 4 and 5, and chroma of 6 through 8. The B horizon ranges to sandy clay and clay loam.

Fluvanna series

Soils of the Fluvanna series are clayey, mixed, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly yellowish red clay and is strongly mottled. These soils formed in material that weathered from mixed basic and acidic rock. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 15 percent.

Fluvanna soils are commonly near Colfax, Helena, Orange, and Worsham soils. They are better drained than these soils. They do not have a fragipan like the Colfax soils, a very firm, very sticky and very plastic argillic horizon like the Helena and Orange soils, or a gray subsoil like the Worsham soils.

Typical pedon of Fluvanna silt loam, 2 to 7 percent slopes, 50 feet east of Route 623 and 1,800 feet southwest of the junction of Routes 623 and 624, near Hylas:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; 1 percent rounded quartz pebbles that are as much as 40 millimeters in diameter; very strongly acid; abrupt smooth boundary.

A2—2 to 9 inches; light yellowish brown (2.5Y 6/5) silt loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; 6 percent rounded quartz pebbles that are as much as 40 millimeters in diameter; very strongly acid; gradual smooth boundary.

B1t—9 to 12 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common fine, medium, and coarse roots; few fine and medium pores; thin patchy clay films; 5 percent rounded quartz pebbles that are as much as 40 millimeters in diameter; very strongly acid; gradual smooth boundary.

B21t—12 to 22 inches; yellowish red (5YR 4/8) clay; few fine prominent yellowish brown (10YR 5/8) and red (2.5YR 4/8) mottles; moderate medium angular blocky structure; firm, sticky and plastic; few fine and medium roots; common fine and medium pores; moderately thick continuous clay films; very strongly acid; gradual smooth boundary.

B22t—22 to 35 inches; yellowish red (5YR 4/8) clay; many fine and medium prominent red (2.5YR 4/8) and common medium prominent yellowish brown (10YR 5/8) mottles; strong fine angular blocky structure; firm, sticky and plastic; few fine and medium roots; moderately thick continuous clay films; very strongly acid; gradual smooth boundary.

B23t—35 to 49 inches; yellowish red (5YR 4/8) clay; many medium prominent red (2.5YR 4/8) and yellowish brown (10YR 5/8) and few fine distinct light gray (5YR 7/1) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thick discontinuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

B3t—49 to 59 inches; yellowish red (5YR 4/8), light gray (5YR 7/1), yellowish brown (10YR 5/8), and red (2.5YR 4/8) clay; weak coarse subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; very thick discontinuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

C—59 to 70 inches; yellowish red (5YR 4/8), light gray (5YR 7/1), yellowish brown (10YR 5/8), and red (2.5YR 4/8) weathered rock that crushes to clay loam; rock-controlled structure; friable, sticky and slightly plastic; few fine mica flakes; very strongly acid.

The solum is 28 to 60 inches thick. Hard bedrock is at a depth of more than 6 feet. Rounded and angular quartz pebbles, as much as 75 millimeters in diameter, make up 0 to 10 percent of the solum.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 6, and chroma of 2 through 4.

The B2t horizon has hue of 5YR or 7.5YR, value of 4 through 6, and chroma of 6 through 8. It is commonly strongly mottled in hue of 2.5YR through 10YR, value of 4 through 6, and chroma of 6 through 8. Low-chroma mottles are common below a depth of about 35 inches.

The C horizon ranges from clay loam to loam or silt loam.

Fluvaquents

The Fluvaquents are deep, poorly drained soils that formed in sandy, loamy, and clayey alluvium. They are on small flood plains on the Coastal Plain and the Piedmont. Slopes range from 0 to 2 percent.

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the subgroup.

Generally, the A horizon is gray, dark gray, or black. It ranges from loamy sand to clay loam. In many pedons, a mat of partially decayed organic matter covers the surface.

In most pedons, the substratum is strongly gleyed and is gray, greenish gray, or bluish gray, with brighter mottles. Thin, dark gray or black strata, high in content of organic matter, are in many pedons.

In some pedons, the substratum below a depth of about 40 inches is sand and gravel. In most places, these soils are deep to bedrock; therefore, the bedrock does not limit the use of these soils.

Forestdale series

Soils of the Forestdale series are fine, montmorillonitic, thermic Typic Ochraqualfs. They are deep, poorly drained soils that have a subsoil consisting mostly of gray clay and clay loam. These soils formed in alluvium on low stream terraces on the Piedmont and the Coastal Plain and on low flats on the Piedmont. Slopes are commonly 0 to 2 percent.

The Forestdale soils in this survey area are a taxadjunct to the Forestdale series because they are neutral to mildly alkaline in the lower part of the Bt horizon. This difference does not alter the use and behavior of these soils.

Forestdale soils are commonly near Chewacla, Dogue, and Wehadkee soils. They are more poorly drained than the Chewacla and Dogue soils. They have more clay than the Wehadkee soils.

Typical pedon of Forestdale loam, frequently flooded, 300 feet southeast of U.S. 360, 1 1/5 miles southeast of U.S. 360 bridge over the Pamunkey River:

Ap—0 to 8 inches; dark grayish brown (2.5Y 4/2) loam; moderate medium granular structure; friable, slightly sticky and slighty plastic; common fine roots; few fine and medium pores; strongly acid; abrupt smooth boundary.

B21tg—8 to 20 inches; dark gray (N 4/0) clay; common medium prominent strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; strong coarse prismatic structure; very firm, sticky and plastic; common fine roots; thick continuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

B22tg—20 to 35 inches; dark gray (N 4/0) clay; many medium prominent strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure; very firm, sticky and plastic; few fine roots; thick continuous clay films; few fine mica flakes; neutral; gradual wavy boundary.

B3tg—35 to 46 inches; light gray (5Y 6/1) clay loam; common medium distinct dark gray (N 4/0) and common medium prominent yellowish brown (10YR 5/6) mottles; massive; firm, sticky and plastic; few fine roots; few fine and medium pores; few thick vertical clay films; common fine black concretions; few fine mica flakes; mildly alkaline; gradual wavy boundary.

Cg—46 to 60 inches; light gray (5Y 6/1) fine sandy loam; coarse prominent yellowish brown (10YR 5/6) mottles; massive; friable, slightly sticky and slighty plastic; common fine and medium pores; common fine black concretions; common fine mica flakes; thin strata of sandy clay; neutral.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 2.5Y and 10YR, value of 4 and 5, and chroma of 1 and 2.

The Bt horizon has hue of 10YR to 5Y or it is neutral. It has value of 4 through 6 and chroma of 0 and 1. High-chroma mottles are common.

The C horizon ranges from fine sandy loam to sandy loam and sandy clay loam.

Fork series

Soils of the Fork series are fine-loamy, mixed, thermic Aeric Ochraqualfs. They are deep, somewhat poorly drained soils that have a subsoil that is mostly olive gray sandy clay loam and has high-chroma mottles. These soils formed in alluvium on stream terraces on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Fork soils are commonly near Tarboro, Forestdale, and Pamunkey soils. They are more poorly drained than the Tarboro and Pamunkey soils and have more clay than the Tarboro soils. They are not as poorly drained as the Forestdale soils, and they have less clay.

Typical pedon of Fork fine sandy loam, 500 feet west of U.S. 360, about 2,500 feet south of the Pamunkey River, about 1 mile southwest of U.S. 360 bridge over the Pamunkey River:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium prominent olive gray

(5Y 4/2) and yellowish red (5YR 4/6) mottles; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; common fine and medium pores; 2 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; few fine mica flakes; medium acid; abrupt wavy boundary.

A2—10 to 18 inches; light olive brown (2.5Y 5/4) fine sandy loam; common fine and medium distinct strong brown (7.5YR 5/6) and few fine faint grayish brown (2.5Y 5/2) mottles; weak fine granular structure; friable, slightly sticky and nonplastic; few fine roots; few fine pores; 5 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; few fine mica flakes; medium acid; clear smooth boundary.

B1t—18 to 25 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; few thin clay films; 1 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; few fine mica flakes; medium acid; gradual smooth boundary.

B2tg—25 to 35 inches; olive gray (5Y 5/2) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine and medium pores; few thin clay films; common fine mica flakes; medium acid; gradual smooth boundary.

B3tg—35 to 42 inches; olive gray (5Y 5/2) and yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, sticky and plastic; few fine pores; 1 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; few fine mica flakes; slightly acid; gradual wavy boundary.

Cg—42 to 64 inches; olive gray (5Y 5/2) and strong brown (7.5YR 5/6) loamy sand; single grain; loose, slightly sticky and nonplastic; few fine mica flakes; slightly acid.

The solum ranges in thickness from 40 inches to more than 60 inches. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 40 millimeters in diameter make up 0 to 10 percent of the solum and 0 to 20 percent of the substratum.

The A horizon has chroma of 1 through 4. In some pedons, it has high-chroma mottles.

The B horizon has hue of 10YR, 2.5Y, and 5Y; value of 5 and 6; and chroma of 1 through 6.

The C horizon ranges from silty clay loam to loam or loamy sand.

Georgeville series

Soils of the Georgeville series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly red silty clay. These soils formed in material that weathered from fine-grained metamorphic rock. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 20 percent.

Georgeville soils are commonly near Appling, Fluvanna, Orange, and Pinkston soils. They have a redder subsoil than the Appling and Fluvanna soils. They are better drained than the Orange soils and have a redder, less sticky and plastic subsoil. They have a redder subsoil than the Pinkston soils and have a thicker solum.

Typical pedon of Georgeville loam, 2 to 7 percent slopes, about 3,000 feet northwest of Route 623, about 1,400 feet northeast of the junction of Routes 623 and 624, near Abners Church:

Ap—0 to 10 inches; dark brown (7.5YR 4/4) loam; moderate fine granular structure; friable, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; 3 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; very strongly acid; abrupt smooth boundary.

B21t—10 to 20 inches; red (2.5YR 4/6) silty clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few medium pores; thin continuous clay films; strongly acid; gradual smooth boundary.

B22t—20 to 30 inches; red (2.5YR 4/6) silty clay; few coarse prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few medium roots; few medium pores; thick continuous clay films; few fine mica flakes; strongly acid; gradual smooth boundary.

B23t—30 to 40 inches; red (2.5YR 4/6) silty clay; common fine and medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; few fine roots; few fine and medium pores; thin patchy clay films; few thin dark yellowish brown (10YR 4/4) clay lenses; few fine mica flakes; strongly acid; gradual smooth boundary.

B3t—40 to 56 inches; red (2.5YR 4/6) silty clay loam; many fine and coarse prominent yellowish brown (10YR 5/8) and few fine and medium distinct weak red (10R 4/4) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; common fine and medium pores; few thick clay films; few fine mica flakes; strongly acid; gradual smooth boundary.

C—56 to 93 inches; yellowish brown (10YR 5/8), light red (2.5YR 6/6), and weak red (10YR 4/4) weathered fine-grained rock that crushes easily to silty clay loam; rock-controlled structure; friable, sticky and plastic; common fine mica flakes; strongly acid.

The solum is 40 to 60 inches thick. Hard bedrock is at a depth of more than 5 feet.

The A horizon has color value of 4 and 5 and chroma of 4 through 6. It is 0 to 5 percent rounded and angular quartz pebbles.

The Bt horizon has hue of 2.5YR and 10R, value of 4 and 5, and chroma of 6 through 8. In many pedons, it has mottles of 10YR or 7.5YR. The range in texture includes clay, silty clay, and silty clay loam.

In the C horizon the range in texture includes silty clay loam, silt loam, and loam.

Goldsboro series

Soils of the Goldsboro series are fine-loamy, siliceous, thermic Aquic Paleudults. They are deep, moderately well drained soils that have a thick subsoil that is mostly yellowish brown and strong brown sandy clay loam. The subsoil is gray in the lower part and has gray mottles below a depth of about 22 inches. These soils formed in fluviomarine sediments in low-lying areas, in depressions, at the head of drainageways, and along the lower part of side slopes on the Coastal Plain. Slopes range from 0 to 4 percent.

Goldsboro soils are near Augusta, Bourne, Duplin, and Kempsville soils. They are not as poorly drained as the Augusta soils, and, unlike the Bourne soils, they do not have a fragipan. They have less clay than the Duplin soils. They are not as well drained as the Kempsville soils.

Typical pedon of Goldsboro fine sandy loam, 0 to 4 percent slopes, 3,600 feet east of VEPCO power line, 600 feet north of Route 738, and 2,000 feet west of the Pamunkey River:

A1—0 to 4 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; common fine and medium pores; 2 percent rounded quartz pebbles that are as much as 15 millimeters in diameter; strongly acid; clear smooth boundary.

A2—4 to 10 inches; light yellowish brown (10YR 6/4) fine sandy loam; few fine faint dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; friable, slightly sticky and nonplastic; common fine and medium roots; few coarse roots; common fine and medium pores; strongly acid; clear smooth boundary.

B1t—10 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; common fine and medium roots; few thin clay films; very strongly acid; clear smooth boundary.

B21t—16 to 22 inches; yellowish brown (10YR 5/4) sandy clay loam; few fine faint pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium pores; thin patchy clay films; 1 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; gradual smooth boundary.

B22t—22 to 32 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct gray (10YR 6/1) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; few fine pores; thin patchy clay films; 10 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; gradual smooth boundary.

B23t—32 to 43 inches; yellowish brown (10YR 5/4) sandy clay loam; many coarse distinct gray (10YR 6/1) and common medium faint yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few thin clay films; 10 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; gradual smooth boundary.

B3tg—43 to 69 inches; gray (10YR 6/1) sandy clay loam; common coarse distinct yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; common fine medium and coarse pores; few thin clay films; 12 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; gradual smooth boundary.

Cg—69 to 90 inches; gray (10YR 6/1) and yellowish brown (10YR 5/6) sandy loam; massive; friable, slightly sticky and slightly plastic; 10 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles make up 0 to 15 percent of the solum and the substratum.

The A horizon has hue of 2.5Y and 10YR, value of 4 through 6, and chroma of 2 through 4.

The B2t horizon has value of 4 and 5 and chroma of 4 through 8. In most pedons, it has low-chroma mottles below a depth of 22 inches. The B3t horizon commonly has hue of 10YR and 2.5Y, value of 5 and 6, and chroma of 1 and 2.

Helena series

Soils of the Helena series are clayey, mixed, thermic Aquic Hapludults. They are deep, moderately well drained soils that have a subsoil that consists mostly of yellowish brown, strong brown, and gray clay loam and clay. These soils formed in material that weathered from mixed acidic and basic rocks. The Helena soils are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 15 percent but are dominantly 2 to 7 percent.

Helena soils are commonly near Abell, Colfax, Orange, and Worsham soils. They have more clay than the Abell and Colfax soils, and, unlike the Colfax soils, they do not have a fragipan. They are more acid throughout than the

Orange soils, and they are better drained than the Worsham soils. In this survey area, Helena soils are mapped only in complex with Colfax and Orange soils.

Typical pedon of Helena sandy loam, in an area of Helena-Colfax complex, 2 to 7 percent slopes, 200 feet west of Route 658, 2,700 feet south of Goshen Crossroads:

A1—0 to 2 inches; olive brown (2.5Y 4/4) sandy loam; moderate fine granular structure; friable, slightly sticky and nonplastic; common fine medium and coarse roots; common fine and medium pores; 1 percent angular quartz pebbles that are as much as 10 millimeters in diameter; very strongly acid; abrupt smooth boundary.

A2—2 to 6 inches; light olive brown (2.5Y 5/4) sandy loam; weak medium granular structure; friable, sticky and slightly plastic; common fine, medium, and coarse roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B1t—6 to 12 inches; yellowish brown (10YR 5/6) clay loam; common fine and medium distinct strong brown (7.5YR 5/8), few fine prominent yellowish red (5YR 4/8), and few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine and medium roots; few fine and medium pores; few fine mica flakes; thin discontinuous clay films; very strongly acid; clear smooth boundary.

B21t—12 to 30 inches; strong brown (7.5YR 5/6) clay; many coarse prominent gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; thin discontinuous clay films; few fine mica flakes; very strongly acid; clear wavy boundary.

B22tg—30 to 47 inches; gray (10YR 6/1) clay; few fine prominent strong brown (7.5YR 5/6) mottles; strong coarse prismatic structure parting to strong coarse subangular blocky; very firm, very sticky and very plastic; few fine roots; thick continuous clay films; 1 percent angular quartz pebbles, as much as 50 millimeters in diameter, in veins; few fine mica flakes; very strongly acid; gradual wavy boundary.

Cg—47 to 60 inches; light olive gray (5Y 6/2) clay loam; rock-controlled structure; firm, sticky and plastic; micaceous clay lenses that are as much as 3 inches thick; few veins of fractured quartz; very strongly acid.

The solum is 30 to 50 inches thick. Bedrock is at a depth of more than 4 feet.

The A horizon has value of 4 through 6 and chroma of 2 through 4.

The Bt horizon in the upper part has hue of 10YR, 7.5YR, and 2.5Y; value of 4 through 6; and chroma of 6 through 8. Low-chroma mottles are at a depth of about 12 inches, and they increase in number with depth. The Bt horizon in the lower part has hue of 10YR and 2.5Y, value of 5 and 6, and chroma of 1 and 2. High-chroma mottles are throughout the Bt horizon.

Hydraquents

The Hydraquents are deep, very poorly drained soils that formed in sandy, loamy, and clayey alluvium. They are in low areas, mainly on the Coastal Plain, that are flooded for long periods or are covered by tidal waters. Slopes are 0 to 2 percent.

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the subgroup.

Generally, the A horizon is gray or black and ranges from loamy fine sand to silt loam, clay loam, and clay. In most places it is mucky, and it is commonly covered by a mat of partially decayed organic matter that is laced with plant roots. The substratum is gray, greenish gray, or bluish gray and ranges from fine sand to clay. Strata of dark gray or black, mucky material are at various depths.

Iredell series

Soils of the Iredell series are fine, montmorillonitic, thermic Typic Hapludalfs. They are deep, moderately well drained to somewhat poorly drained soils that have a subsoil that consists mostly of mottled, yellowish brown and pale olive clay. These soils formed in material that weathered from basic rock that is high in ferromagnesian minerals. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 15 percent.

Iredell soils are commonly near Fluvanna, Forestdale, Helena, Orange, and Vance soils. They are not as well drained as the Fluvanna and Vance soils or as poorly drained as the Forestdale soils. They are not as acid as the Helena soils, and they have less silt than the Orange soils. In this survey area, Iredell soils were mapped only in complex with Orange soils.

Typical pedon of Iredell sandy loam, in an area of Orange-Iredell complex, 2 to 7 percent slopes, 700 feet southwest of the crossing of VEPCO power line on Route 617, about 400 feet east of Route 617, about 3,500 feet northeast of Taylor's Creek:

A1—0 to 2 inches; dark grayish brown (2.5Y 4/2) sandy loam; weak fine granular structure; very friable, slightly sticky and nonplastic; many fine and medium roots; common fine and medium pores; 1 percent angular quartz pebbles that are as much as 30 millimeters in diameter; medium acid; abrupt smooth boundary.

A2—2 to 9 inches; yellowish brown (10YR 5/4) and light yellowish brown (10YR 6/4) sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many medium and coarse roots; many fine and medium pores; 1 percent angular quartz peb-

bles that are as much as 75 millimeters in diameter; medium acid; clear smooth boundary.

B21t—9 to 20 inches; yellowish brown (10YR 5/6) clay; few coarse distinct pale olive (5Y 6/4) mottles; strong very coarse prismatic structure parting to strong coarse angular blocky; very firm, sticky and very plastic; few fine and medium roots; thick continuous clay films; 1 percent angular quartz pebbles that are as much as 25 millimeters in diameter; slightly acid; abrupt wavy boundary.

B22t—20 to 29 inches; pale olive (5Y 6/3) clay; common coarse prominent strong brown (7.5YR 5/8) mottles; moderate coarse angular blocky structure; very firm, very sticky and very plastic; thick continuous clay films; common slickensides; 1 percent angular quartz pebbles that are as much as 25 millimeters in diameter; few fine mica flakes; neutral; gradual wavy boundary.

B3t—29 to 34 inches; pale olive (5Y 6/3) clay loam; common coarse prominent strong brown (7.5YR 5/8) mottles; weak coarse angular blocky structure; firm, sticky and plastic; thin continuous clay films; 1 percent angular quartz pebbles that are as much as 30 millimeters in diameter; common fine mica flakes; mildly alkaline; gradual wavy boundary.

C—34 to 90 inches; olive (5Y 5/4), strong brown (7.5YR 5/8), white (10YR 8/2), and black (10YR 2/1) micaceous sandy clay loam; rock-controlled structure; friable, slightly sticky and slightly plastic; mildly alkaline.

The solum is 20 to 36 inches thick. Bedrock is at a depth of more than 6 feet. Angular quartz pebbles, as much as 75 millimeters in diameter, make up 1 to about 5 percent of the solum.

The A horizon has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 2 through 4.

The Bt horizon has hue of 10YR, 2.5Y, and 5Y; value of 5 and 6; and chroma of 3 through 6.

The C horizon has hue of 5Y to 7.5YR, value of 2 through 8, and chroma of 1 through 6. It is loam, silt loam, sandy loam, or clay loam.

Kempsville series

Soils of the Kempsville series are fine-loamy, siliceous, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil consisting mostly of yellowish brown, brown, and strong brown sandy clay loam. These soils formed in loamy, fluviomarine sediments. They are on broad ridgetops on the Coastal Plain. Slopes range from 0 to 7 percent.

Kempsville soils are commonly near Bourne, Faceville, Norfolk, and Orangeburg soils. They do not have a fragipan like the Bourne soils, and they have less clay than the Faceville soils. They have a thinner solum than the Norfolk and Orangeburg soils.

Typical pedon of Kempsville fine sandy loam in a complex of Kempsville-Bourne fine sandy loams, 2 to 7 percent slopes, about 1,200 feet northeast of the junction of Route 54 and Route 798, about 40 feet west of Route 54:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine, medium, and coarse roots; common fine and medium pores; very strongly acid; clear smooth boundary.

A2—4 to 12 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B1t—12 to 18 inches; yellowish brown (10YR 5/4) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; few thin clay films; very strongly acid; clear smooth boundary.

B21t—18 to 29 inches; brown (7.5YR 4/4) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; thin patchy clay films; very strongly acid; clear wavy boundary.

B22t—29 to 39 inches; yellowish brown (10YR 5/4) sandy clay loam; many coarse distinct pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable, slightly sticky, and 30 percent of mass is brittle and compact; few fine roots; clay bridging between sand grains; 2 percent quartz pebbles that are as much as 15 millimeters in diameter; very strongly acid; clear wavy boundary.

B23t—39 to 45 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; few thin clay films; 5 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; gradual smooth boundary.

B3t—45 to 60 inches; strong brown (7.5YR 5/6) gravelly sandy loam; weak fine subangular blocky structure; friable, sticky and slightly plastic; few fine roots; common fine and medium pores; few thin clay films; 30 percent rounded quartz pebbles that are as much as 30 millimeters in diameter; very strongly acid.

The solum is 40 to more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 50 millimeters in diameter, make up 0 to 5 percent of the solum.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 5, and chroma of 2 through 4.

The Bt horizon has hue of 10YR to 5YR, value of 4 through 6, and chroma of 4 through 8. Pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) mottles are at

a depth of about 29 inches. The mottled horizon is brittle and compact in less than 50 percent of its mass.

Kenansville series

Soils of the Kenansville series are loamy, siliceous, thermic Arenic Hapludults. They are deep, well drained soils that have a thick surface layer consisting of loamy sand and a subsoil consisting of yellowish brown and strong brown sandy loam and sandy clay loam. These soils formed in sandy and loamy fluviomarine sediments. They are on narrow to somewhat broad ridgetops on the Coastal Plain. Slopes range from 2 to 7 percent.

Kenansville soils are commonly near Faceville, Kempsville, Orangeburg, and Suffolk soils. Unlike these soils, Kenansville soils have a thick surface layer of loamy sand. They have less clay and more sand than these soils.

Typical pedon of Kenansville loamy sand, 2 to 7 percent slopes, 300 feet west of the junction of Routes 636 and 615:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; many fine and medium and few coarse roots; very strongly acid; clear smooth boundary.

A21—4 to 18 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; common fine and few medium and coarse roots; very strongly acid; clear smooth boundary.

A22—18 to 21 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; few fine and medium roots; 10 percent dark brown (10YR 4/4) nodules of sand; very strongly acid; clear wavy boundary.

B1t—21 to 24 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable, slightly brittle, slightly sticky and nonplastic; few fine and medium roots; few vesicular pores; very strongly acid; clear wavy boundary.

B21t—24 to 29 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; friable, slightly sticky and nonplastic; few fine and medium roots; bridging between sand grains; very strongly acid; gradual smooth boundary.

B22t—29 to 41 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; many fine pores; bridging between sand grains; very strongly acid; gradual smooth boundary.

B23t—41 to 48 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; bridging between sand grains; very strongly acid; gradual wavy boundary.

C—48 to 99 inches; strong brown (7.5YR 5/8) loamy sand; single grain; very friable, slightly sticky and slightly plastic; very strongly acid.

The solum is 34 to 50 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon is about 20 to 30 inches thick. It has hue of 10YR and 2.5Y, value of 4 through 6, and chroma of 2 through 6.

The Bt horizon has hue of 10YR and 7.5YR, value of 5 and 6, and chroma of 4 through 8.

The C horizon is loamy sand or sand. In some pedons, it is gravelly.

Kenansville Variant

The Kenansville Variant soils are loamy, siliceous, thermic Arenic Hapludults. They are deep, moderately well drained soils that have a thick surface layer of loamy sand and a subsoil that consists of pale brown and strong brown loamy sand and fine sandy loam and has gray mottles below a depth of about 27 inches. These soils formed in alluvium on low stream terraces and flood plains on the Coastal Plain. Slopes are 0 to 2 percent.

Kenansville Variant soils are commonly near Augusta, Chewacla, and Wehadkee soils. Unlike these soils, Kenansville Variant soils have a thick surface layer of loamy sand. They have less clay and more sand than Augusta, Chewacla, and Wehadkee soils, and they are better drained than the Augusta and Wehadkee soils.

Typical pedon of Kenansville Variant loamy sand, 1,500 feet north of Grapevine Bridge on Route 156, 1,500 feet west of the junction of Routes 156 and 630:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; common fine and medium roots; many coarse medium and fine pores; dark organic stains on sand grains; abrupt wavy boundary.

A2—9 to 21 inches; yellowish brown (10YR 5/6) loamy sand; many medium and coarse faint pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) and few fine faint strong brown (7.5YR 5/6) mottles; single grain; very friable, nonsticky and nonplastic; few fine roots; many fine and medium pores; few sand grains coated with clay; few black sand-sized mineral grains; very strongly acid; clear wavy boundary.

B1t—21 to 27 inches; pale brown (10YR 6/3) loamy sand; many medium faint yellowish brown (10YR 5/6) and light yellowish brown (10YR 6/4) mottles; very weak medium subangular blocky structure; very friable, nonsticky and nonplastic; few fine roots; many fine and medium pores; few sand grains coated with clay; few black sand-sized mineral grains; very strongly acid; gradual smooth boundary.

B2t—27 to 34 inches; strong brown (7.5YR 5/6) fine sandy loam; many medium and coarse distinct gray (10YR 6/1) and common medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine roots; many fine and medium pores; clay bridging between sand grains; few sand grains coated with clay; few black sand-sized rounded mineral grains; very strongly acid; gradual smooth boundary.

C1g—34 to 44 inches; gray (10YR 6/1) strong brown (7/5YR 5/6) and yellowish brown (10YR 5/6) loamy sand; single grain; loose; common black sand-sized rounded mineral grains; strongly acid; gradual smooth boundary.

C2g—44 to 76 inches; gray (10YR 6/1) and white (10YR 8/1) sand; few quartz pebbles that are as much as 40 millimeters in diameter; common black sand-sized mineral grains; medium acid.

The solum is 30 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 6, and chroma of 2 through 6.

The Bt horizon has hue of 10YR and 7.5YR, value of 4 through 6, and chroma of 3 through 8. Mottles that have chroma of 2 or less are at a depth of 27 inches or more.

Lenoir series

Soils of the Lenoir series are clayey, mixed, thermic Aeric Paleaquults. They are deep, somewhat poorly drained soils that have a subsoil consisting mostly of olive gray and gray clay. These soils formed in clayey, fluviomarine sediments. They are on broad ridges and in depressions on the Coastal Plain. Slopes are 0 to 2 percent.

Lenoir soils are commonly near Coxville, Dogue, Dunbar, and Duplin soils. They are not as poorly drained as the Coxville soils. They are more poorly drained than the Dogue and Duplin soils. They have more silt than the Dunbar soils.

Typical pedon of Lenoir loam, about 20 feet south of farm lane, about 250 feet north of buried cable by Route 646, about 4,000 feet northwest of Hanover Courthouse:

A1—0 to 3 inches; gray (10YR 5/1) loam; moderate medium granular structure; friable, sticky and slightly plastic; many fine, medium, and coarse roots; common fine and medium pores; very strongly acid; abrupt smooth boundary.

A2—3 to 9 inches; light brownish gray (2.5Y 6/2) loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium granular structure; friable, sticky and slightly plastic; common fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B21t—9 to 12 inches; light olive brown (2.5Y 5/4) silty clay loam; common fine faint grayish brown (2.5Y 5/2) and common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and medium roots; common fine pores; thin discontinuous clay films; very strongly acid; clear smooth boundary.

B22tg—12 to 27 inches; olive gray (5Y 5/2) clay; common medium prominent yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, sticky and plastic; few fine and medium roots; few fine pores; thick discontinuous clay films; very strongly acid; gradual smooth boundary.

B23tg—27 to 57 inches; gray (N 5/0) clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate fine angular blocky; very firm, sticky and plastic; few fine roots; thick continuous clay films; very strongly acid; gradual smooth boundary.

B3tg—57 to 84 inches; gray (N 6/0) clay; common medium prominent brownish yellow (10YR 5/8) mottles; strong coarse angular blocky structure; very firm, sticky and plastic; few fine roots; thick continuous clay films; very strongly acid; gradual smooth boundary.

C—84 to 99 inches; brownish yellow (10YR 6/8) and gray (10YR 6/1) clay with pockets of sandy clay loam; massive; very firm, sticky and plastic; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 4 through 5, and chroma of 1 and 2.

The B21t has hue of 2.5Y and 10YR, value of 5 and 6, and chroma of 2 through 4. It commonly has high-chroma mottles. The Btg horizon has hue of 5Y, 2.5Y, and 10YR, or it is neutral. It has value of 4 through 6 and chroma of 0 through 2.

Masada series

Soils of the Masada series are clayey, mixed, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil consisting mostly of strong brown, yellowish red, and yellowish brown clay loam and clay. These soils formed in older alluvium that is often some distance from and some distance above present flood plains. They are on ridgetops and high stream terraces on the Piedmont and the western edge of the Coastal Plain. Slopes are 2 to 7 percent.

Masada soils are commonly near Appling, Edgehill Variant, Faceville, and Turbeville soils. They have mixed mineralogy rather than the kaolinitic mineralogy of the Appling and Faceville soils. They have more clay than the Edgehill Variant soils and do not have the gravelly texture. They are not as red in the subsoil as the Turbeville soils.

Representative profile of Masada fine sandy loam, 2 to 7 percent slopes, about 1,500 feet southwest of Camptown Race Track, 800 feet east of Interstate 95:

Ap—0 to 8 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine roots; common fine pores; neutral; clear smooth boundary.

B1t—8 to 14 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine pores; thin patchy clay films; very strongly acid; clear smooth boundary.

B21t—14 to 20 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine roots; common fine and few medium pores; thin discontinuous clay films; very strongly acid; gradual smooth boundary.

B22t—20 to 40 inches; yellowish red (5YR 5/8), strong brown (7.5YR 5/6), and yellowish brown (10YR 5/8) clay; moderate very thick platy structure parting to moderate medium subangular blocky; friable, sticky and plastic; few fine roots; few fine pores; common fine mica flakes; thin continuous dark yellowish brown (10YR 4/4) clay films; very strongly acid; gradual smooth boundary.

B23t—40 to 53 inches; yellowish red (5YR 5/8), strong brown (7.5YR 5/8), yellowish brown (10YR 5/8), and grayish brown (10YR 5/2) clay loam; moderate coarse subangular blocky structure; friable, sticky and plastic; few fine pores; thick discontinuous clay films; common fine mica flakes; very strongly acid; gradual smooth boundary.

B3t—53 to 60 inches; strong brown (7.5YR 5/8), dark yellowish brown (10YR 4/4), yellowish brown (10YR 5/8), and light brownish gray (10YR 6/2) sandy clay loam; weak coarse angular blocky structure; friable, sticky and plastic; few fine pores; thick patchy clay films; common fine mica flakes; very strongly acid; clear wavy boundary.

C—60 to 67 inches; strong brown (7.5Y 5/8), yellowish brown (10YR 5/8), dark yellowish brown (10YR 4/4), and light brownish gray (10YR 6/2) sandy loam; massive; friable, slightly sticky and slightly plastic; common fine mica flakes; very strongly acid; clear wavy boundary.

The solum is 45 to more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 2.5Y and 10YR, value of 4 and 5, and chroma of 2 through 4.

The Bt horizon has hue of 10YR, 7.5YR, and 5YR; value of 4 through 6; and chroma of 4 through 8. In many pedons, it is strongly mottled or variegated. In many pedons, it has low-chroma mottles below a depth of about 40 inches.

The C horizon ranges from sandy loam to clay and their gravelly analogs.

Mayodan series

Soils of the Mayodan series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly yellowish red clay. These soils formed in material that weathered from Triassic sandstone. They are on ridgetops and side slopes on the Piedmont. Slopes are 2 to 45 percent.

Mayodan soils are commonly near Bourne, Creedmoor, Faceville, and Pinkston soils. They are better drained than the Bourne and Creedmoor soils, and they do not have a fragipan like the Bourne soils. They have a thinner solum than the Faceville soils and are not as red in the lower part of the subsoil. They have more clay and a thicker solum than the Pinkston soils. In this survey area, the Mayodan soils are mapped only in complex with Creedmoor and Pinkston soils.

Typical pedon of Mayodan sandy loam, in an area of Mayodan-Creedmoor complex, 2 to 7 percent slopes, 2,500 feet north of Route 690, 2,000 feet south of Little River, 4,000 feet west of Little River Bridge on U.S. 1, and 200 feet south of pond:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; few fine pores; very strongly acid; clear smooth boundary.

A2—3 to 8 inches; yellowish brown (10YR 5/4) sandy loam; moderate fine granular structure; friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; common fine and medium pores; 10 percent angular quartz pebbles that are as much as 50 millimeters in diameter; strongly acid; clear smooth boundary.

B21t—8 to 13 inches; yellowish red (5YR 4/8) clay; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and medium roots; few fine and medium pores; thin patchy clay films; 10 percent angular quartz pebbles that are as much as 50 millimeters in diameter; few fine flakes of mica; very strongly acid; clear smooth boundary.

B22t—13 to 33 inches; yellowish red (5YR 4/8) clay; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; few fine and medium pores; thin continuous clay films; common fine flakes of mica; very strongly acid; gradual smooth boundary.

B3t—33 to 47 inches; yellowish red (5YR 4/8) clay; common medium distinct strong brown (7.5YR 5/8) and common fine prominent white (N 8/0) mottles; weak medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine pores; thin discontinuous clay films; 3 percent angular quartz pebbles that are as much as 5 millimeters in diame-

ter; common fine crystals of feldspar; common fine flakes of mica; very strongly acid; gradual smooth boundary.

C1—47 to 65 inches; yellowish red (5YR 5/8) sandy clay loam; rock-controlled structure; friable, slightly sticky and slightly plastic; 3 percent angular quartz pebbles that are as much as 5 millimeters in diameter; common fine flakes of mica; very strongly acid; gradual smooth boundary.

C2—65 to 89 inches; strong brown (7.5YR 5/6) clay loam and sandy clay loam; rock-controlled structure; friable, slightly sticky and slightly plastic; common fine flakes of mica; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has color value of 4 or 5 and chroma of 2 through 4.

The Bt horizon has color value of 4 and 5 and chroma of 6 through 8.

Myatt Variant

The Myatt Variant soils are fine-loamy, mixed, thermic Typic Ochraquults. They are deep, poorly drained soils that have a subsoil consisting mostly of light brownish gray sandy clay loam and clay loam. These soils formed in alluvium on low terraces and flood plains on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Myatt Variant soils are commonly near Altavista, Augusta, Chewacla, and Kenansville Variant soils. They are more poorly drained than these soils.

Typical pedon of Myatt Variant fine sandy loam, about 1,500 feet southeast of U.S. 301, about 500 feet north of the Chickahominy River, about 1,500 feet northwest of the junction of Routes 627 and 638:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; few medium and fine roots; extremely acid; abrupt smooth boundary.

A21—2 to 5 inches; light brownish gray (2.5Y 6/2) fine sandy loam; few fine and medium distinct brownish yellow (10YR 6/6) mottles; weak fine granular structure; friable, nonsticky and nonplastic; few fine roots; few fine pores; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; extremely acid; clear smooth boundary.

A22—5 to 10 inches; light gray (2.5Y 7/2) fine sandy loam; few fine and medium distinct light yellowish brown (2.5Y 6/4) and brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; extremely acid; clear wavy boundary.

B1tg—10 to 17 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and few fine faint light yellowish brown (2.5Y 6/4) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; thin clay films; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; extremely acid; clear smooth boundary.

B2tg—17 to 36 inches; mottled light brownish gray (2.5Y 6/2) and grayish brown (2.5Y 5/2) clay loam; moderate medium angular blocky structure; firm, sticky and plastic; few fine roots; few fine and medium pores; thin clay films; brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) coatings on ped faces; few fine flakes of mica; extremely acid; clear smooth boundary.

B3tg—36 to 45 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common coarse faint light yellowish brown (2.5Y 6/4) mottles; massive; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; 10 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent quartz cobblestones; extremely acid; clear wavy boundary.

Cg—45 to 60 inches; light olive gray (5Y 6/2), light gray (5Y 6/1), and brownish yellow (10YR 6/6) fine sandy loam; massive; friable, slightly sticky and nonplastic; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine flakes of mica; extremely acid.

The solum is 30 to 50 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 1 to 15 percent of the solum. In many pedons, quartz cobblestones make up 0 to about 3 percent of the solum in the lower part.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 6, and chroma of 1 and 2.

The Bt horizon has hue of 2.5Y, 5Y, and 10YR; value of 5 and 6; and chroma of 2 or less.

In the C horizon, the range in texture includes fine sandy loam, sandy loam, sand, and gravelly sand.

Norfolk series

Soils of the Norfolk series are fine-loamy, siliceous, thermic Typic Paleudults. They are deep, well drained soils that have a subsoil that consists mostly of yellowish brown and strong brown clay loam and is strongly mottled below a depth of about 44 inches. These soils formed in loamy, fluviomarine sediments. They are on broad ridges on the Coastal Plain. Slopes are 0 to 7 percent.

Norfolk soils are commonly near Bourne, Dunbar, Duplin, Faceville, and Orangeburg soils. Unlike the Bourne soils, they do not have a fragipan, and they are

better drained. They are better drained than the Dunbar and Duplin soils and have less clay. They have less clay than the Faceville soils. They are not as red in the subsoil as the Orangeburg soils.

Typical pedon of Norfolk fine sandy loam, 2 to 7 percent slopes, in a wooded area approximately 30 feet south of Route 602 and about 1 mile northwest of the junction of Routes 602 and 688:

Ap—0 to 9 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; common fine, medium, and coarse roots; few fine and medium pores; strongly acid; clear smooth boundary.

A2—9 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; few fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B1—14 to 20 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; few thin clay films; very strongly acid; clear smooth boundary.

B21t—20 to 25 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine and medium roots; common fine and medium pores; thin discontinuous clay films; very strongly acid; clear smooth boundary.

B22t—25 to 33 inches; yellowish brown (10YR 5/6) clay loam; common fine distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; very strongly acid; clear smooth boundary.

B23t—33 to 44 inches; strong brown (7.5YR 5/6) clay loam; common medium prominent yellowish red (5YR 4/8) and common medium distinct yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky and angular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; very strongly acid; gradual smooth boundary.

B3t—44 to 80 inches; red (2.5YR 4/6), yellowish red (5YR 4/8), yellowish brown (10YR 4/8), strong brown (7.5YR 5/8), and gray (10YR 6/1) clay loam; moderate very thick platy structure parting to moderate medium subangular blocky; firm, sticky and plastic; few fine and medium pores; thick patchy clay films; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 2.5Y and 10YR, value of 3 through 6, and chroma of 2 through 4.

The Bt horizon above a depth of about 44 inches has hue of 10YR and 7.5YR, value of 5 and 6, and chroma of 6 through 8.

Ochrepts

These soils are on the Piedmont and on the Coastal Plain. They are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the suborder.

On the Piedmont, the Ochrepts are moderately deep and well drained to excessively drained. They formed in the residuum of acidic and basic rocks. They are on narrow, convex ridgetops and finger-shaped ridges; on narrow to wide, convex side slopes along the larger, more deeply incised drainageways; and on convex side slopes between the uplands and the terraces and between the terraces and the flood plains of the larger streams. Slopes range from 5 to 90 percent but are mainly 5 to 45 percent.

Generally, the A horizon is grayish brown to brown fine sandy loam, sandy loam, loam, or clay loam about 5 to 10 inches thick. In some pedons, it is gravelly or very gravelly. The B horizon is yellowish brown to red fine sandy loam, sandy loam, loam, clay loam, and clay about 4 to 24 inches thick. In some pedons, it is gravelly or very gravelly. The C horizon is yellowish brown to red sandy loam, loam, and clay loam and is gravelly or very gravelly in some pedons. Bedrock is commonly at a depth of 2 to 3 1/2 feet.

On the Coastal Plain, the Ochrepts are deep and moderately well drained to excessively drained. They formed in sandy, loamy, and clayey, fluviomarine sediments. They are on narrow, convex ridgetops; on narrow to wide, convex side slopes along the larger, more deeply incised drainageways; and on convex side slopes between the uplands and the terraces and between the terraces and the flood plains of the larger streams. Slopes range from 2 to 90 percent.

Generally, the A horizon is gray to brown sand and loamy sand to clay. It is 6 to 18 inches thick. In some pedons, it is gravelly or very gravelly. The B horizon ranges from gray to red and from sand to clay. It is 20 to 50 inches thick. In some pedons, it is gravelly or very gravelly. Many of the pedons that have the firmer, more plastic clay loam and clay subsoils have low-chroma mottles. The C horizon commonly is similar to the B horizon in color and texture.

In this survey area, Ochrepts are mapped only in complex with Udalfs and Udults.

Orange series

Soils of the Orange series are fine, montmorillonitic, thermic Albaquic Hapludalfs. They are deep, somewhat poorly drained to moderately well drained soils that have a subsoil consisting mostly of yellowish brown, light olive

brown, and gray clay. These soils formed in material that weathered from basic rock. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 15 percent.

Orange soils are commonly near Colfax, Fluvanna, Forestdale, Helena, and Iredell soils. They have more clay than the Colfax soils and do not have a fragipan. They are not as well drained as the Fluvanna soils, and they are not as poorly drained as the Forestdale soils. They are not as acid as the Helena soils, and they have more silt than the Iredell soils. In this survey area, Orange soils are mapped only in complex with Iredell soils and Helena soils.

Typical pedon of Orange fine sandy loam, in an area of Orange-Iredell complex, 2 to 7 percent slopes, 1,000 feet east of the junction of Routes 623 and 624:

A1—0 to 2 inches; dark gray (5Y 4/1) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine and medium roots; common multicolored quartz grains; very strongly acid; abrupt boundary.

A2—2 to 6 inches; light brownish gray (2.5Y 6/2) fine sandy loam; few medium faint light olive brown (2.5Y 5/6) mottles; weak fine granular structure; friable, slightly sticky and nonplastic; few fine and medium roots; common multicolored quartz grains; 1 percent angular quartz pebbles that are as much as 25 millimeters in diameter; strongly acid; abrupt smooth boundary.

B1—6 to 10 inches; yellowish brown (10YR 5/4) loam; many coarse faint brownish yellow (10YR 6/6) and many coarse distinct strong brown (7.5YR 5/6) and light gray (N 7/0) mottles; moderate coarse subangular blocky structure; firm, sticky and plastic; common medium and coarse roots; few fine pores; thick continuous clay films; 1 percent angular quartz pebbles that are as much as 50 millimeters in diameter; medium acid; gradual smooth boundary.

B21t—10 to 19 inches; light olive brown (2.5Y 5/4) clay loam; many coarse distinct gray (5Y 5/1) mottles; strong medium subangular blocky structure; very firm, sticky and plastic; few fine roots; few fine pores; thick discontinuous clay films; 2 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; few feldspar crystals; mildly alkaline.

B22t—19 to 33 inches; mottled light olive brown (2.5Y 5/4), olive (5Y 5/3), yellowish brown (10YR 5/8), and gray (5Y 6/1) clay; strong very coarse prismatic structure; very firm, very sticky and very plastic; few fine roots; few fine pores; few slickensides; 4 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; few fine feldspar crystals; moderately alkaline; gradual wavy boundary.

B3tg—33 to 42 inches; gray (5Y 6/1) clay loam; common coarse distinct olive (5Y 5/3) and common coarse prominent yellowish brown (10YR 5/8) mottles; strong very coarse prismatic structure; very firm, very sticky and very plastic; few fine roots; few fine pores; few slickensides; thin veins of feldspar crystals; 9 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; moderately alkaline; clear wavy boundary.

C—42 to 60 inches; gray (5Y 6/1), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/8) saprolite that crushes easily to sandy loam; rock-controlled structure; friable, slightly sticky and slightly plastic; 6 percent angular quartz pebbles, as much as 75 millimeters in diameter, in veins; common fine mica flakes; mildly alkaline.

The solum is 30 to 45 inches thick. Hard bedrock is at a depth of more than 4 feet. Angular quartz pebbles, as much as 75 millimeters in diameter, make up about 1 percent to 10 percent of the solum and the substratum.

The A horizon has hue of 5Y, 2.5Y, and 10YR; value of 4 through 6; and chroma of 1 through 4.

The Bt horizon has hue of 10YR, 2.5Y, and 5Y; value of 5 and 6; and chroma of 3 through 8. It contains high-chroma and low-chroma mottles.

The C horizon ranges from sandy loam to loam and sandy clay loam.

Orangeburg series

Soils of the Orangeburg series are fine-loamy, siliceous, thermic Typic Paleudults. They are deep, well drained soils that have a thick subsoil that consists mostly of brown, yellowish red, and red sandy clay loam. These soils formed in loamy, fluviomarine sediments. They are on ridgetops and side slopes on the Coastal Plain. Slopes range from 0 to 15 percent but are mainly 2 to 7 percent.

Orangeburg soils are commonly near Faceville, Kempsville, Norfolk, and Suffolk soils. They have less clay than the Faceville soils. They have a redder and thicker subsoil than the Kempsville and Suffolk soils, and, unlike the Kempsville soils, they do not have a brittle and compact layer. They have a redder subsoil than the Norfolk soils.

Typical pedon of Orangeburg fine sandy loam, 2 to 7 percent slopes, approximately 3,500 feet north of the junction of Routes 54 and 798:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable, slightly sticky and nonplastic; many fine and medium roots; common fine and medium pores; very strongly acid; abrupt smooth boundary.

A2—3 to 16 inches; light yellowish brown (10YR 6/4) fine sandy loam; few medium faint pale brown (10YR 6/3) mottles; weak fine granular structure; very friable, slightly sticky and nonplastic; many fine and medium roots; common fine and medium pores; strongly acid; gradual smooth boundary.

B1t—16 to 22 inches; brown (7.5YR 5/4) sandy clay loam; common fine distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine and medium pores; very strongly acid; clear smooth boundary.

B21t—22 to 39 inches; yellowish red (5YR 4/6) sandy clay loam; few fine prominent light yellowish brown (10YR 6/4) mottles; weak fine subangular blocky structure; friable, sticky and plastic; few fine and medium roots; common fine and medium pores; thin patchy clay films; very strongly acid; gradual smooth boundary.

B22t—39 to 70 inches; red (2.5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable, sticky and plastic; few fine and medium roots; common fine and medium pores; thin patchy clay films; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has color value of 4 through 6 and chroma of 2 through 4.

The Bt horizon has hue of 7.5YR, 5YR, and 2.5YR; value of 4 and 5; and chroma of 4 through 8.

Pacolet series

Soils of the Pacolet series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil consisting mostly of yellowish red and red clay loam and clay. These soils formed in material that weathered from granite and granite-gneiss. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 25 percent, but are mainly 2 to 15 percent.

Pacolet soils are commonly near Appling, Cecil, and Cullen soils. They have a thinner solum than the Appling and Cecil soils, and they have a redder subsoil than the Appling soils. They have a thinner solum than the Cullen soils, and they do not have a dark red subsoil.

Typical pedon of Pacolet fine sandy loam, 7 to 15 percent slopes, eroded, about three-fourths of a mile north of the junction of Routes 631 and 722, about 150 feet east of Route 722, in pines on east side of small field:

Ap1—0 to 2 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate fine granular structure; friable, slightly sticky and slightly plastic, many fine roots; many fine pores; very strongly acid; abrupt smooth boundary.

Ap2—2 to 5 inches; strong brown (7.5YR 5/6) fine sandy loam; moderate fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; many fine pores; very strongly acid; clear smooth boundary.

B1t—5 to 12 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and few medium roots; common fine pores; thin discontinuous clay films; 5 percent angular quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; clear smooth boundary.

B2t—12 to 26 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; common fine mica flakes; strongly acid; gradual smooth boundary.

B3t—26 to 35 inches; red (2.5YR 4/6) clay loam; common fine prominent brownish yellow (10YR 6/8) and reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few fine pores; thin discontinuous clay films; common fine mica flakes; strongly acid; diffuse wavy boundary.

C—35 to 60 inches; yellowish red (5YR 5/6) and reddish yellow (7.5YR 5/6), micaceous loam; rock-controlled structure; friable, nonsticky and nonplastic; red (2.5YR 4/6) clay flows in upper part; strongly acid.

The solum is 20 to 36 inches thick. Bedrock is at a depth of more than 5 feet. Angular and rounded quartz pebbles, as much as 75 millimeters in diameter, make up 0 to 20 percent of the A horizon and 0 to 10 percent of the B horizon and the substratum.

The A horizon has hue of 10YR and 7.5YR, value of 4 through 6, and chroma of 3 through 6. It ranges from fine sandy loam to clay loam and gravelly sandy loam.

The Bt horizon has hue of 5YR and 2.5YR, value of 4 and 5, and chroma of 6 through 8.

Pamunkey series

Soils of the Pamunkey series are fine-loamy, mixed, thermic Ultic Hapludalfs. They are deep, well drained soils that have a subsoil that is mostly yellowish red sandy clay loam. These soils formed in alluvium on stream terraces on the Piedmont and the Coastal Plain. Slopes range from 0 to 7 percent but are dominantly 2 to 7 percent.

Pamunkey soils are commonly near Altavista, Augusta, Dogue, and Fork soils. They are better drained than these soils. They have less clay than the Dogue soils.

Typical pedon of Pamunkey fine sandy loam, 2 to 7 percent slopes, by Camptown Racetrack, 250 feet south of the South Anna River, 1 mile east of Interstate 95:

Ap—0 to 9 inches; dark brown (7.5YR 4/4) fine sandy loam; moderate fine granular structure; very friable, slightly sticky and nonplastic; many fine and medium roots; 3 percent rounded quartz pebbles that are as much as 35 millimeters in diameter; few fine mica flakes; neutral; abrupt smooth boundary.

B1t—9 to 12 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; many

fine roots; few thin clay films; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; slightly acid; clear smooth boundary.

B21t—12 to 26 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; thin continuous clay films; 5 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; common black oxide stains; few fine mica flakes; slightly acid; gradual smooth boundary.

B22t—26 to 40 inches; yellowish red (5YR 4/8) sandy clay loam; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; thin patchy clay films; 5 percent rounded quartz pebbles that are as much as 20 millimeters in diameter; common black oxide stains; slightly acid; gradual smooth boundary.

B3t—40 to 46 inches; yellowish red (5YR 4/8) sandy loam; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; few thin clay films; 10 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; common black oxide stains; common fine mica flakes; medium acid; abrupt wavy boundary.

C—46 to 99 inches; yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and reddish brown (5YR 4/4) sand and gravel; single grain; loose; 2 percent cobblestones; some boulders, which are as much as 1 meter in diameter; common fine mica flakes; medium acid.

The solum is 40 to 55 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 1 to about 15 percent of the solum.

The A horizon has hue of 7.5YR, 10YR, and 5YR; value of 3 through 6; and chroma of 2 through 4. It is fine sandy loam or loamy sand.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 through 6, and chroma of 4 through 8.

The C horizon ranges from sandy loam and gravelly sandy loam to sand and gravel.

Pamunkey Variant

The Pamunkey Variant soils are loamy-skeletal, mixed, thermic Ultic Hapludalfs. They are deep, somewhat excessively drained soils that have a subsoil consisting mostly of reddish brown, yellowish red, and strong brown gravelly sandy loam, very gravelly sandy loam, and gravelly loamy sand. These soils formed in alluvium on stream terraces on the Piedmont and the Coastal Plain. Slopes are 0 to 4 percent.

Pamunkey Variant soils are commonly near Altavista, Tarboro, Fork, and Forestdale soils. They are more excessively drained than the Altavista, Fork, and Forestdale soils and have more pebbles throughout the solum. They are not as excessively drained as the Tarboro soils and have more pebbles throughout the solum.

Typical pedon of Pamunkey Variant gravelly sandy loam, 0 to 4 percent slopes, about 1 1/4 miles north of Morris Bridge on Route 30, about 1,000 feet south and 1,000 feet west of the North Anna River.

Ap—0 to 9 inches; dark brown (10YR 4/3) gravelly sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; common fine roots; 25 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 1 percent quartz cobblestones; neutral; abrupt smooth boundary.

B1—9 to 14 inches; reddish brown (5YR 4/4) gravelly sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few thin clay films; 20 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; neutral; clear smooth boundary.

B2t—14 to 26 inches; reddish brown (5YR 4/4) very gravelly sandy loam; weak medium angular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; 50 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 3 percent quartz cobblestones; strongly acid; gradual smooth boundary.

B3—26 to 41 inches; yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) gravelly loamy sand; single grain; very friable, nonsticky and nonplastic; 30 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 2 percent quartz cobblestones; strongly acid; gradual smooth boundary.

C—41 to 60 inches; layers of strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) loamy sand and gravelly sand; single grain; loose; strongly acid.

The solum is 24 to 45 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 25 to 35 percent of the A horizon and 20 to 50 percent of the B horizon. Cobblestones make up 0 to 5 percent of the solum.

The A horizon has hue of 10YR and 7.5YR, value of 3 and 4, and chroma of 2 through 4.

The B horizon has hue of 5YR, 7.5YR, and, in some places, 10YR; value of 4 through 6; and chroma of 4 through 8.

Pinkston series

Soils of the Pinkston series are coarse-loamy, mixed, thermic Ruptic-Ultic Dystrochrepts. They are moderately deep, well drained to excessively drained soils that have a subsoil consisting mostly of yellowish brown sandy loam and sandy clay loam. These soils formed in material that weathered from sandstone, sandstone conglom-

erate, and sandy shale. They are on ridgetops and side slopes on the Piedmont. Slopes are 7 to 45 percent.

Pinkston soils are commonly near Creedmoor and Mayodan soils. They have less clay than the Creedmoor and Mayodan soils, and they are better drained than the Creedmoor soils. In this survey area, the Pinkston soils are mapped only in complex with Mayodan soils.

Typical pedon of Pinkston sandy loam in an area of Pinkston-Mayodan sandy loams, 25 to 45 percent slopes, about 1,000 feet north of the South Anna River, in a road bank on west side of Route 735:

A1—0 to 2 inches; dark grayish brown (2.5Y 4/2) sandy loam; weak fine granular structure; very friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; 6 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; very strongly acid; abrupt wavy boundary.

A2—2 to 12 inches; yellowish brown (10YR 5/6) sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; 10 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; few fine mica flakes; very strongly acid; clear wavy boundary.

B2—12 to 32 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; pockets and lenses of yellowish brown (10YR 5/4) sandy clay loam, 2 to 10 inches thick, make up about 40 percent of this horizon; 2 percent small easily crushed sandstone fragments; common fine mica flakes; very strongly acid; abrupt wavy boundary.

R—32 inches; sandstone that contains thin clay flows in seams in the upper 8 inches.

The solum is commonly 15 to 35 inches thick. Bedrock is at a depth of 20 to 40 inches. Rounded and angular quartz and sandstone pebbles, as much as 75 millimeters in diameter, make up 2 to 20 percent of the A horizon and 2 to about 35 percent of the B horizon. Quartz and sandstone cobblestones make up 0 to 10 percent of the solum.

The A horizon has hue of 2.5Y and 10YR, value of 4 through 6, and chroma of 2 through 6.

The B horizon has hue of 10YR, 7.5YR, and 5YR; value of 4 and 5; and chroma of 4 through 8. The pockets of Bt material in the B2 horizon range from sandy clay loam to clay loam.

Rains series

Soils of the Rains series are fine-loamy, siliceous, thermic Typic Paleaquults. They are deep, poorly drained soils that have a thick subsoil that is mostly gray sandy clay loam. These soils formed in loamy, fluviomarine sediments. They are in low-lying areas along drainageways on the Coastal Plain. Slopes range from 0 to 2 percent.

Rains soils are commonly near Dunbar, Duplin, Goldsboro, and Suffolk soils. They are more poorly drained than these soils. They have less clay than the Dunbar and Duplin soils.

Typical pedon of Rains fine sandy loam, about 2,000 feet south of the Pamunkey River and about 3,000 feet northeast of the junction of Routes 732 and 629:

Ap—0 to 9 inches; very dark grayish brown (2.5Y 3.2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine roots; few fine pores; slightly acid; clear smooth boundary.

A2—9 to 17 inches; olive gray (5Y 5/2) fine sandy loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable, slightly sticky and nonplastic; few fine roots; few fine pores; strongly acid; clear smooth boundary.

B21tg—17 to 33 inches; gray (5Y 5/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable, sticky and plastic; few fine roots; few fine and medium pores; few medium krotovinas; thin patchy clay films; very strongly acid; gradual smooth boundary.

B22tg—33 to 51 inches; gray (N 5/0) sandy clay loam; many coarse prominent yellowish brown (10YR 5/8) and few medium prominent yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; common fine and medium pores; thin patchy clay films; very strongly acid; gradual wavy boundary.

B3tg—51 to 68 inches; gray (N 5/0) sandy clay loam; common medium prominent (10YR 5/8) mottles; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots, few fine and medium pores; thin patchy clay films; very strongly acid; gradual wavy boundary.

Cg—68 to 80 inches; gray (N 5/0) stratified sand and clay; massive; friable to firm, sticky and plastic; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 2.5Y and 5Y, value of 3 through 5, and chroma of 2.

The B horizon has hue of 5Y, or it is neutral. It has value of 4 through 6 and chroma of 0 and 1.

Spotsylvania series

Soils of the Spotsylvania series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil consisting mostly of yellowish brown, strong brown, and yellowish red sandy clay loam and clay. These soils formed in a thin layer of fluviomar-

ine sediments and material that weathered from granite and granite-gneiss. Spotsylvania soils are on ridgetops and side slopes on the eastern edge of the Piedmont. Slopes are 2 to 15 percent.

Spotsylvania soils are commonly near Bourne, Faceville, Vance, and Varina soils. Unlike these soils, Spotsylvania soils have a IIBt horizon. They have more clay than the Bourne soils, and they do not have a fragipan. They are not as red in the subsoil as the Faceville soils, they are not as firm in the subsoil as the Vance soils, and they do not have the plinthite of the Varina soils.

Typical pedon of Spotsylvania fine sandy loam, in an area of Spotsylvania-Bourne fine sandy loams, 2 to 7 percent slopes, 300 feet northeast of Route 738, 800 feet east of the VEPCO transmission line crossing Route 638:

A1—0 to 2 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine, medium, and coarse roots; common fine and medium pores; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; very strongly acid; abrupt smooth boundary.

A2—2 to 12 inches; light yellowish brown (10YR 6/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; common fine, medium, and coarse roots; common fine and medium pores; 1 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; medium acid; gradual smooth boundary.

B21t—12 to 19 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; common fine and medium roots; few fine and medium pores; thin discontinuous clay films; 10 percent rounded quartz pebbles that are as much as 10 millimeters in diameter; very strongly acid; clear smooth boundary.

B22t—19 to 25 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium faint light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine roots; common fine and medium pores; thin patchy clay films; 15 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 1 percent rounded quartz cobblestones; very strongly acid; clear wavy boundary.

IIB23t—25 to 41 inches; strong brown (7.5YR 5/8) clay; common fine distinct yellowish red (5YR 4/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; thin continuous clay films; few fine mica flakes; very strongly acid; gradual smooth boundary.

IIB24t—41 to 60 inches; yellowish red (5YR 4/8), strong brown (7.5YR 5/8), red (2.5YR 4/8), and gray (10YR 6/1) clay; moderate very thick platy structure parting to moderate medium angular blocky; firm, sticky and plastic; few fine roots; moderately thick continuous clay films; common fine mica flakes; very strongly acid.

The solum is 40 to more than 60 inches thick. The IIB2t horizon is at a depth of 20 to 40 inches. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 1 to 20 percent of the solum above the IIB2t horizon, and quartz cobblestones make up 0 to 5 percent. Angular quartz or feldspar pebbles, as much as 50 millimeters in diameter, make up 0 to 15 percent of the solum below the IIB2t horizon. A thin layer of pebbles is often at the contact between the B2t and IIB2t horizons.

The A horizon has hue of 10YR and 2.5Y, value of 3 through 6, and chroma of 2 through 4.

The B and IIB horizons have hue of 7.5YR, 5YR, 2.5YR, and 10YR; value of 4 and 5; and chroma of 6 through 8. In many pedons, there are low-chroma mottles below a depth of about 41 inches.

Suffolk series

Soils of the Suffolk series are fine-loamy, siliceous, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly strong brown sandy clay loam. These soils formed in loamy, fluviomarine sediments. They are on ridgetops and side slopes on the Coastal Plain.

Suffolk soils are commonly near Faceville, Kempsville, Kenansville, Norfolk, and Orangeburg soils. They have less clay and a thinner solum than the Faceville soils. Unlike the Kempsville soils, they do not have a brittle and compact layer. They have a thinner solum than the Norfolk and Orangeburg soils. They have a thinner surface layer than the Kenansville soils.

Typical pedon of Suffolk loamy fine sand, 0 to 2 percent slopes, in a cultivated field about 2,700 feet east of Route 615, approximately one-half mile south of Simpkins Corner:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable, nonsticky and nonplastic; common fine roots; neutral; abrupt smooth boundary.

A2—9 to 14 inches; yellowish brown (10YR 5/6) sandy loam; weak medium granular structure; very friable, slightly sticky and nonplastic; few fine roots; slightly acid; clear smooth boundary.

B1t—14 to 18 inches; strong brown (7.5YR 5/6) sandy clay loam; very weak medium subangular blocky structure; friable, slightly sticky and nonplastic; few fine roots; common clay bridging; strongly acid; clear smooth boundary.

B2t—18 to 36 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; thin discontinuous clay films; very strongly acid; clear smooth boundary.

B3—36 to 51 inches; yellowish brown (10YR 5/6) sandy loam; very weak coarse subangular blocky structure; very friable, slightly sticky and slightly plastic; very strongly acid; clear smooth boundary.
C—51 to 72 inches; strong brown (7.5YR 5/6) sandy loam; massive; very friable, slightly sticky and nonplastic; very strongly acid.

The solum is 40 to 60 inches thick.

The A horizon has hue of 10YR and 7.5YR, value of 4 and 5, and chroma of 2 through 6.

The Bt horizon has value of 4 and 5 and chroma of 4 through 8.

The C horizon ranges from sandy loam to loamy fine sand and sand.

Tarboro series

Soils of the Tarboro series are mixed, thermic Typic Udipsamments. They are deep, somewhat excessively drained soils that have a thick substratum that is mostly reddish brown, brown, and strong brown and sandy. These soils formed in alluvium on stream terraces on the Piedmont and the Coastal Plain. Slopes are commonly 2 to 7 percent.

Tarboro soils are commonly near Altavista and Pamunkey soils. They have less clay and more sand and are more excessively drained than Altavista and Pamunckey soils, and they do not have the argillic horizon of these soils.

Typical pedon of Tarboro loamy sand, 2 to 7 percent slopes, 200 feet east of Route 614, one-third mile northwest of the junction of Routes 614 and 728:

O1—1 inch to 0; partially decomposed pine needles and twigs.
Ap—0 to 12 inches; dark brown (7.5YR 3/2) loamy sand; weak fine granular structure; very friable, nonsticky and nonplastic; common fine and medium roots; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; strongly acid; clear smooth boundary.
C1—12 to 23 inches; reddish brown (5YR 4/4) loamy sand; single grain; very friable, nonsticky and nonplastic; few fine and medium roots; 5 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; strongly acid; gradual smooth boundary.
C2—23 to 36 inches; brown (7.5YR 4/4) loamy sand; single grain; loose, nonsticky and nonplastic; few fine roots; 5 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; strongly acid; gradual smooth boundary.
C3—36 to 58 inches; strong brown (7.5YR 5/6) loamy sand; single grain; loose, nonsticky and nonplastic; 10 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; medium acid; gradual smooth boundary.
C4—58 to 94 inches; brown (7.5YR 4/4) gravelly loamy sand; single grain; loose, nonsticky and nonplastic; 30 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; medium acid.

Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 50 millimeters in diameter, make up 1 to 10 percent of the A horizon and the substratum above a depth of about 48 inches and 4 to 35 percent of the substratum below a depth of about 48 inches. In most pedons, few to common fine mica flakes are throughout the A horizon and the substratum.

The A horizon has hue of 7.5YR and 10YR, value of 3 to 5, and chroma of 2 to 6.

In the lower part of the substratum in some pedons, there are layers of gravel and layers of sand.

Turbeville series

Soils of the Turbeville series are clayey, mixed, thermic Typic Paleudults. They are deep, well drained soils that have a subsoil that is mostly dark red clay. These soils formed in older alluvium that is often above and some distance from present flood plains. They are on ridgetops and high stream terraces on the Piedmont and the Coastal Plain. Slopes range from about 2 to 7 percent.

Turbeville soils are commonly near Edgehill Variant, Faceville, Masada, and Pamunkey soils. They have more clay than the Edgehill Variant and Pamunkey soils and do not have the pebble content of the Edgehill Variant soils. Unlike the Faceville and Masada soils, they have a dark red subsoil. They have mixed mineralogy, whereas the Faceville soils have kaolinitic mineralogy.

Typical pedon of Turbeville fine sandy loam, 2 to 7 percent slopes, about three fifths of a mile south of Route 684 and 1,000 feet north of Little River:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; many fine, medium, and coarse roots; many fine and medium pores; strongly acid; abrupt smooth boundary.
A2—2 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable, slightly sticky and nonplastic; many fine, medium, and coarse roots; common fine and medium pores; strongly acid; gradual smooth boundary.
B1t—10 to 15 inches; yellowish red (5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable, sticky and slightly plastic; common fine, medium, and coarse roots; many fine and medium pores; thin patchy clay films; strongly acid; gradual smooth boundary.
B21t—15 to 22 inches; dark red (2.5YR 3/6) clay loam; moderate fine subangular blocky structure; friable, sticky and plastic, common fine and medium roots; few fine and medium pores; thin continuous clay films; strongly acid; gradual smooth boundary.

B22t—22 to 57 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable, sticky and plastic; few fine and medium roots; common fine and medium pores; thin continuous clay films; 1 percent black subangular sand grains of smoked quartz; few fine mica flakes; strongly acid; gradual smooth boundary.

B23t—57 to 88 inches; dark red (10YR 3/6) clay; moderate fine subangular blocky structure; friable, sticky and plastic; few fine roots; common fine and medium pores; thin continuous clay films; 1 percent subrounded quartz pebbles that are as much as 30 millimeters in diameter; many fine mica flakes; strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 through 4.

The Bt horizon has hue of 5YR, 2.5YR, and 10R; value of 3 and 4; and chroma of 4 through 8.

Udalfs

Udalfs have an argillic horizon. They are moderately deep to deep and well drained to excessively drained. They formed in the residuum of acidic and basic rocks. They are on the Piedmont on narrow, convex ridgetops and finger-shaped ridges; on narrow to wide, convex side slopes along the larger, more deeply incised drainageways; and on convex side slopes between the uplands and the terraces and between the terraces and flood plains of the larger streams. Slopes range from 2 to 90 percent but are mainly 5 to 45 percent.

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the suborder.

Generally, the A horizon is grayish brown to brown fine sandy loam, sandy loam, loam, silt loam, or clay loam about 6 to 12 inches thick. In some pedons, it is gravelly or very gravelly. The B horizon ranges from yellowish brown to red and from fine sandy loam, sandy loam, loam, and clay loam to clay. In some pedons it is gravelly or very gravelly. The C horizon is yellowish brown to red sandy loam, loam, and clay loam and is gravelly or very gravelly in some pedons. Bedrock is generally at a depth of 2 to 5 feet or more.

In this survey area, Udalfs were mapped only in complex with Ochrepts.

Udifluvents

The Udifluvents are deep, moderately well drained and well drained soils that formed in alluvium. They are on flood plains on the Coastal Plain and the Piedmont. Slopes are commonly 0 to 2 percent.

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the great group.

Generally, the A horizon ranges from brown and dark brown to gray and dark gray and from loam to loamy sand or sand. It is about 8 to 18 inches thick. The substratum to a depth of about 60 inches is commonly brown, dark brown, and yellowish brown loam, sandy loam, sandy clay loam, silt loam, loamy sand, and sand. Some Udifluvents have low-chroma mottles below a depth of about 20 inches. Some have thin strata of clay in the substratum. Some have thin strata of dark gray or dark grayish brown sand, loamy sand, and gravel in the substratum. Udifluvents are commonly medium acid to very strongly acid throughout.

Udorthents

Udorthents are soils in cut and fill areas and in other areas where the soil material has been reworked by machinery. Most of the areas have been reshaped and smoothed. Some Udorthents are in areas along Interstate 95, and some are in areas used for the construction of industrial, commercial, and residential complexes. In some places, cuts and other excavations are deep and extend into the underlying geologic material. Udorthents are so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the great group. These soils are on the Coastal Plain and the Piedmont.

Udorthents range from deep to shallow and from moderately well drained to excessively drained. They are commonly composed of loamy and clayey soil material that is similar to the soil material surrounding the cut and fill areas. Slopes range from 0 to about 30 percent.

Generally, the surface layer is brown, strong brown, yellowish brown, or yellowish red loam, sandy clay loam, clay loam, or clay. Where topsoil has been spread, the surface layer is commonly brown or grayish brown fine sandy loam, loam, or silt loam. The substratum is yellowish brown to yellowish red and red sandy clay loam to clay. Some Udorthents are gravelly or very gravelly. Some contain rock fragments and rubble. These soils are commonly medium acid to very strongly acid throughout.

Udults

These soils are so intermingled and so varied in properties and characteristics that it was not practical to map them separately or at a level of classification below the suborder.

Udults are deep, moderately well drained to excessively drained soils. They formed in sandy, loamy, and clayey, fluviomarine sediments. They are on the Coastal Plain on ridgetops, on side slopes along drainageways and streams, on side slopes between uplands and terraces and between terraces and flood plains, and on terrace breaks. Slopes range from 2 to 90 percent.

Generally, the A horizon is gray to dark brown loamy fine sand and loamy sand to sandy loam and loam. It is about 4 to about 12 inches thick. The B horizon is yellowish brown and pale brown to red sand and loamy sand to firm plastic clay. It ranges from less than 10 inches to more than 40 inches in thickness. Gray mottles are in some Udults, commonly below a depth of about 20 inches. The substratum ranges from sand to clay. In some Udults the surface layer, the subsoil or the substratum, or all of these are gravelly or very gravelly. In most places, these soils are quite deep to bedrock; therefore, bedrock generally does not limit the use of these soils.

Vance series

Soils of the Vance series are clayey, mixed, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil that is mostly strong brown clay and is strongly mottled in yellowish red, red, and gray. These soils formed in material that weathered from granite and granite-gneiss. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 25 percent but are mainly 2 to 15 percent.

Vance soils are commonly near Appling, Cecil, Spotsylvania, and Varina soils. Unlike these soils, Vance soils have a very firm subsoil. They do not have the IIBt horizon of the Spotsylvania soils or the plinthite of the Varina soils.

Typical pedon of Vance fine sandy loam, 2 to 7 percent slopes, about 100 feet south of Route 610 and about 2,000 feet west of the western junction of Routes 610 and 617:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate fine granular structure; friable; slightly sticky and slightly plastic; many fine and medium roots; common fine and medium pores; 1 percent angular quartz pebbles that are as much as 75 millimeters in diameter; very strongly acid; abrupt smooth boundary.

B1t—8 to 12 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine and medium pores; thin patchy clay films; 10 percent angular quartz pebbles that are as much as 25 millimeters in diameter; very strongly acid; clear smooth boundary.

B21t—12 to 23 inches; strong brown (7.5YR 5/6) clay; common fine distinct red (2.5YR 4/8) and yellowish red (5YR 4/6) mottles; strong fine angular blocky structure; very firm, sticky and plastic; few fine roots; moderately thick continuous clay films; 3 percent angular quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; extremely acid; gradual smooth boundary.

B22t—23 to 30 inches; strong brown (7.5YR 5/6) clay; common medium distinct yellowish red (5YR 4/8) and common medium prominent light olive brown (2.5Y 5/8), red (10R 4/8), and light olive gray (5Y 6/2) mottles; strong fine angular blocky structure; very firm, sticky and very plastic; few fine and medium roots; moderately thick continuous clay films; 2 percent angular quartz pebbles that are as much as 50 millimeters in diameter; few fine mica flakes; very strongly acid; gradual smooth boundary.

B23t—30 to 41 inches; strong brown (7.5YR 5/6), red (10R 4/8), and white (10YR 8/1) clay; strong fine angular blocky structure; very firm, sticky and plastic; few fine roots; moderately thick continuous clay films; few fine mica flakes; extremely acid; gradual wavy boundary.

B24t—41 to 48 inches; gray (10YR 6/1), red (10YR 4/8), white (10YR 8/1), and strong brown (7.5YR 5/6) clay; strong coarse subangular blocky structure; very firm, sticky and plastic; few fine roots; moderately thick continuous yellowish brown (10YR 5/6) clay films; few thin gray (10YR 6/1) clay flows; common fine mica flakes; extremely acid; gradual wavy boundary.

C—48 to 68 inches; yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), light gray (2.5Y 7/2), and yellowish red (5YR 4/8), strongly weathered granite-gneiss that crushes easily to clay loam; rock-controlled structure; friable, sticky and plastic; micaceous; extremely acid.

The solum is 24 to 48 inches thick. Bedrock is at a depth of more than 5 feet. Angular and subrounded quartz pebbles, as much as 75 millimeters in diameter, make up 1 to about 30 percent of the A horizon and 0 to about 10 percent of the B and C horizons.

The A horizon has hue of 10YR and 2.5Y, value of 4 and 5, and chroma of 2 through 4. It ranges to gravelly sandy loam.

The Bt horizon in the upper part has hue of 10YR and 7.5YR, value of 4 and 5, and chroma of 6 through 8. It is strongly mottled in hue of 2.5Y through 10R, value of 4 through 8, and chroma of 1 through 8. The Bt horizon in the lower part has mixed colors with hue of 10YR through 10R, value of 4 through 8, and chroma of 1 through 8.

Varina series

Soils of the Varina series are clayey, kaolinitic, thermic Plinthic Paleudults. They are deep, well drained soils that have a B horizon that is mostly strong brown clay loam above a depth of about 42 inches and variegated red, yellowish red, yellowish brown, strong brown, pale brown, and gray clay loam below that depth. These soils formed in loamy and clayey fluviomarine sediments. They are on ridgetops and side slopes on the western edge of the Coastal Plain. Slopes range from 2 to 15 percent.

The Varina soils in this survey are a taxadjunct to the Varina series because the depth to plinthite is less than

is typical and because the slope is 10 to 15 percent. These differences do not affect the use and behavior of these soils.

Varina soils are commonly near Bourne, Cecil, Norfolk, and Vance soils. Unlike these soils, Varina soils have plinthite in the lower part of the solum. Varina soils do not have the fragipan of the Bourne soils, are less red in the B horizon and have a thicker solum than the Cecil soils, and are not as firm in the B horizon and have a thicker solum than the Vance soils.

In this survey area, the Varina soils are mapped only in complex with Bourne soils.

Typical pedon of Varina gravelly sandy loam in an area of Varina-Bourne complex, 2 to 7 percent slopes, 10 feet west of Route 671, about 0.6 mile south of the junction of Routes 671 and 54:

Ap1—0 to 3 inches; dark grayish brown (2.5Y 4/2) gravelly sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; 25 percent rounded quartz pebbles that are as much as 25 millimeters in diameter; strongly acid; clear smooth boundary.

Ap2—3 to 7 inches; light olive brown (2.5Y 5/4) gravelly sandy loam; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine and medium roots; 25 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; 1 percent quartz cobbles; very strongly acid; clear smooth boundary.

B1t—7 to 12 inches; strong brown (7.5YR 5/8), yellowish brown (10YR 5/6), and pale brown (10YR 6/3) gravelly sandy clay loam; weak fine subangular blocky structure; friable, sticky and slightly plastic; many fine and medium roots; many fine and medium pores; thin patchy clay films; 30 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; very strongly acid; clear smooth boundary.

B21t—12 to 32 inches; strong brown (7.5YR 5/6) clay loam; weak fine subangular blocky structure; friable, sticky and plastic; many fine and medium pores; thin patchy clay films; 10 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; very strongly acid; gradual smooth boundary.

B22t—32 to 42 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct red (2.5YR 4/6), yellowish red (5YR 4/8), and yellowish brown (10YR 5/8) mottles; moderate fine angular blocky structure; friable, sticky and plastic; many fine and medium pores; thin discontinuous clay films; 10 percent rounded quartz pebbles that are as much as 75 millimeters in diameter; about 20 percent plinthite nodules; very strongly acid; gradual smooth boundary.

B23t—42 to 65 inches; mottled red (2.5YR 4/6), yellowish red (5YR 4/8), yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), pale brown (10YR 6/3), and gray (10YR 5/1) clay loam; strong thick platy structure; firm, sticky and plastic; 70 percent hardened plinthite nodules; very strongly acid.

The solum is more than 60 inches thick. Bedrock is at a depth of more than 5 feet. Rounded quartz pebbles, as much as 75 millimeters in diameter, make up 5 to 30 percent of the A horizon and the B1 horizon and from 0 to 15 percent of the B2 horizon. Soft plinthite nodules make up 20 to 70 percent of the B5 horizon in the lower part.

The A horizon has hue of 2.5Y and 10YR, value of 4 through 6, and chroma of 2 through 4.

The Bt horizon above a depth of about 32 inches has hue of 7.5YR and 10YR, value of 4 and 6, and chroma of 3 through 8. Below that depth, it has hue of 2.5YR through 10YR, value of 4 through 6, and chroma of 1 through 8.

Wahee series

Soils of the Wahee series are clayey, mixed, thermic Aeric Ochraquults. They are deep, somewhat poorly drained soils that have a subsoil consisting mostly of gray silty clay and silty clay loam. These soils formed in alluvium on low stream terraces on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

Wahee soils are commonly near Altavista, Augusta, Dogue, and Fork soils. They are more poorly drained than the Altavista and Dogue soils, and they have more clay than the Altavista, Augusta, and Fork soils.

Typical pedon of Wahee loam, 700 feet southeast of the junction of Route 646 and the C and O Railroad, near Wickham:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable, slightly sticky and slightly plastic; common fine roots; common fine and medium pores; few fine mica flakes; medium acid; abrupt smooth boundary.

B21t—8 to 21 inches; yellowish brown (10YR 5/8) silty clay; many coarse distinct grayish brown (2.5Y 5/2) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, sticky and plastic; few fine roots; thin continuous clay films; common fine mica flakes; strongly acid; gradual smooth boundary.

B22tg—21 to 35 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, sticky and plastic; few fine roots; common fine and medium pores; thick patchy clay films; many fine mica flakes; very strongly acid; gradual smooth boundary.

B23tg—35 to 44 inches; gray (N 6/0) silty clay; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm, sticky, and plastic; few fine roots; common fine and

medium pores; thick discontinuous clay films; common fine mica flakes; very strongly acid; gradual smooth boundary.

B31tg—44 to 54 inches; gray (N 5/0) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm, sticky and plastic; few fine and medium pores; thick patchy clay films; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

B32tg—54 to 65 inches; gray (N 6/0) micaceous silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable, sticky and plastic; many fine and medium pores; strongly acid.

The solum is 50 to more than 60 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 4 through 6, and chromas of 1 and 2.

The B22t, B23t, B31tg, and B32tg horizons have hue of 10YR or they are neutral. They have value of 4 through 6, and chroma of 0 and 1. These horizons commonly have high-chroma mottles. The B horizon ranges to clay and clay loam.

Wedowee series

Soils of the Wedowee series are clayey, kaolinitic, thermic Typic Hapludults. They are deep, well drained soils that have a subsoil consisting mostly of strong brown and yellowish red clay loam and clay. These soils formed in material that weathered from granite, granite-gneiss, and gneiss. They are on ridgetops and side slopes on the Piedmont. Slopes range from 2 to 30 percent.

Wedowee soils are commonly near Appling, Ashlar, Cecil, Bourne, Spotsylvania, Vance, and Varina soils. They have a thinner solum and somewhat less clay than the Appling, Cecil, and Spotsylvania soils, and they are not as red as the Cecil soils. They have more clay than the Ashlar soils. Unlike the Bourne soils, they do not have a fragipan. They do not have the very firm clayey subsoil of the Vance soils or the plinthite of the Varina soils.

Typical pedon of Wedowee fine sandy loam, 2 to 7 percent slopes, eroded, about one-fourth mile east of the boundary between Louisa County and Hanover County, and 30 feet north of Route 631:

Ap—0 to 5 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable, nonsticky and nonplastic; common fine and medium roots; few fine pores; strongly acid; abrupt smooth boundary.

B21t—5 to 8 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; few fine pores; thin discontinuous clay films; 1 percent angular quartz pebbles that are as much as 25 millimeters in diameter; common fine mica flakes; strongly acid; clear smooth boundary.

B22t—8 to 30 inches; yellowish red (5YR 5/6) clay; strong medium subangular blocky structure; friable, sticky and plastic; few fine roots; few fine pores; thin continuous clay films; common fine mica flakes; strongly acid; gradual wavy boundary.

B23t—30 to 33 inches; strong brown (7.5YR 5/8) and pink (7.5YR 7/4) clay loam; weak very thick platy structure parting to weak medium subangular blocky; friable, nonsticky and slightly plastic; thin continuous yellowish red (5YR 4/8) clay films; many fine mica flakes; strongly acid; gradual irregular boundary.

C—33 to 60 inches; red (2.5YR 5/6), yellowish brown (10YR 5/6), and pinkish white (7.5YR 8/2) strongly weathered gneiss that crushes easily to micaceous loam; rock-controlled structure; friable, nonsticky and nonplastic; many fine mica flakes; strongly acid.

The solum is 20 to 40 inches thick. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 7.5YR, value of 4 and 5, and chroma of 2 through 4. It ranges to clay loam in severely eroded areas.

The B horizon has hue of 10YR, 7.5YR, and 5YR; value of 5; and chroma of 6 through 8. In many pedons, the B horizon in the lower part contains mottles that have chroma of 2 through 8.

The C horizon ranges to sandy loam, sandy clay loam, and clay loam.

Wehadkee series

Soils of the Wehadkee series are fine-loamy, mixed, nonacid, thermic Typic Fluvaquents. They are deep, poorly drained soils that have a subsoil that consists mostly of gray, mottled clay loam, sandy clay loam, and loam. These soils formed in alluvium on flood plains on the Piedmont and the Coastal Plain. Slopes are commonly 0 to 2 percent.

The Wehadkee soils in this survey area are a taxadjunct to the Wehadkee series because they are more acid throughout the solum than is typical. This difference does not affect the use and behavior of these soils.

Wehadkee soils are commonly near Augusta, Chewacla, Forestdale, and Fork soils. They are more poorly drained than the Augusta, Chewacla, and Fork soils. They have less clay than the Forestdale soils.

Typical pedon of Wehadkee loam, about 500 feet south of the Pamunkey River and about 1,400 feet north-northwest of the end of Route 728:

A11—0 to 2 inches; grayish brown (2.5Y 5/2) loam; common fine prominent dark reddish brown (5YR 3/4) mottles; weak fine granular structure; friable, slightly sticky and slightly plastic; many fine roots;

few fine pores; many fine mica flakes; few krotovinas that are as much as 1 inch in diameter; extremely acid; abrupt smooth boundary.

A12—2 to 8 inches; grayish brown (10YR 5/2) loam; common medium prominent dark reddish brown (5YR 3/4) mottles; weak fine subangular blocky structure; friable, sticky and plastic; many fine, medium, and coarse roots; few fine pores; common fine mica flakes; few krotovinas; very strongly acid; gradual smooth boundary.

B1g—8 to 15 inches; olive gray (5Y 5/2) clay loam; common medium prominent brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable, slightly sticky and plastic; many fine, medium, and coarse roots; few fine and medium pores; thin discontinuous silt coatings; common fine and medium mica flakes; few krotovinas; very strongly acid; gradual smooth boundary.

B2g—15 to 22 inches; gray (N 5/0) sandy clay loam, many coarse prominent yellowish red (4YR 4/8) and brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable, sticky and plastic; many fine, medium, and coarse roots; common fine and medium pores; thin discontinuous silt coatings; common fine and few medium mica flakes; few krotovinas; few very fine sand-sized black mineral grains; very strongly acid; gradual smooth boundary.

B31g—22 to 33 inches; gray (5Y 5/1) loam; many coarse prominent brown (7.5YR 5/4) and yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; few fine and medium pores; thin patchy silt coatings; common fine mica flakes; few krotovinas; few very fine sand-sized black mineral grains; very strongly acid; gradual smooth boundary.

B32g—33 to 92 inches; gray (5Y 5/1) loam with pockets of sandy clay loam; many coarse prominent brown (7.5YR 5/4) and yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots; few medium pores; thick continuous silt coatings; 1 percent rounded quartz pebbles that are as much as 50 millimeters in diameter; 1 percent quartz cobblestones; common fine mica flakes; few very fine sand-sized black mineral grains; very strongly acid.

The solum ranges in thickness from 30 inches to more than 60 inches. Bedrock is at a depth of more than 5 feet.

The A horizon has hue of 10YR and 2.5Y, value of 4 and 5, and chroma of 1 and 2.

The B horizon has hue of 10YR to 5Y, or it is neutral. It has value of 5 and 6 and chroma of 0 to 2. High-chroma mottles that have hue of 10YR and 5YR are common throughout the solum.

Worsham series

Soils of the Worsham series are clayey, mixed, thermic Typic Ochraquults. They are deep, poorly drained soils that have a subsoil that consists mostly of light brownish gray and gray, strongly mottled clay loam, clay, and sandy clay loam. These soils formed in material that weathered from granite and granite-gneiss. They are on upland flats, in upland depressions, and at the head of drainageways on the Piedmont. Slopes are 0 to 2 percent.

Worsham soils are commonly near Abell, Colfax, and Helena soils. They are more poorly drained and have more clay than the Abell and Colfax soils. Unlike the Colfax soils, they do not have a fragipan. They are more poorly drained than the Helena soils.

Typical pedon of Worsham fine sandy loam, on the west side of Route 658, about 300 feet south of the junction of Routes 658 and 715, at Green Bay:

A1—0 to 4 inches; gray (10YR 5/1) fine sandy loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; weak medium granular structure; friable, nonsticky and nonplastic; many fine and medium roots; medium acid; clear smooth boundary.

A2—4 to 11 inches; light brownish gray (2.5Y 6/2) fine sandy loam; few fine distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable, slightly sticky and nonplastic; few fine and medium roots; few fine pores; medium acid; clear smooth boundary.

B1tg—11 to 16 inches; light brownish gray (2.5Y 6/2) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; firm, sticky and plastic; few fine roots; few thin clay films; 2 percent angular quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; gradual smooth boundary.

B2tg—16 to 40 inches; gray (10YR 6/1) clay; common medium prominent strong brown (7.5YR 5/8) and few medium prominent red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thin continuous clay films; 5 percent angular quartz pebbles that are as much as 20 millimeters in diameter; very strongly acid; gradual smooth boundary.

B3g—40 to 60 inches; gray (10YR 6/1) sandy clay loam; common fine prominent light reddish brown (5YR 6/3) mottles; weak coarse subangular blocky structure; firm, slightly sticky and slightly plastic; few thin clay flows; very strongly acid.

The solum is 40 to 60 inches thick. Bedrock is at a depth of more than 5 feet. Angular quartz pebbles, as much as 75 millimeters in diameter, make up 0 to about 10 percent of the solum.

The A horizon has hue of 10YR, 2.5Y, and 5Y; value of 4 through 6; and chroma of 1 and 2.

The B horizon has hue of 10YR, 2.5Y, and 5Y; value of 4 through 6; and chroma of 1 and 2. High-chroma mottles that have hue of 2.5YR through 2.5Y are common throughout the B horizon.

Formation of the soils

This section discusses the five factors of soil formation and the processes involved in the formation of the soil horizons.

Factors of soil formation

Soils are formed by the interaction of five major factors: climate, plant and animal life, parent material, relief, and time. The relative influence of each factor generally varies from place to place. Local variation in soils is due mainly to differences in kind of parent material and in relief and drainage. In places, one factor may dominate the formation of a soil and determine most of its properties.

Climate

Hanover County has a continental climate. The average annual rainfall is 41 inches, and the average annual air temperature is 55 degrees F. Rainfall is well distributed throughout the year, but normally July and August are the months of highest rainfall. The relatively high rainfall causes rapid leaching of plant nutrients.

Plant and animal life

All living organisms—vegetation, animals, bacteria, and fungi—are important to soil formation. The vegetation is generally responsible for the content of organic matter, the color of the surface layer, and the supply of nutrients. Animals, especially burrowing animals, help keep the soil open and porous. Bacteria and fungi decompose the vegetation, thus releasing nutrients for plant food.

In Hanover County, the native trees have had more influence on soil formation than any other living organism. Man, however, has greatly changed, physically and chemically, the surface layer where he has cleared the forests and cultivated the soil. He has mixed some of the soil horizons by plowing, and he has added fertilizer, lime, pesticides, and herbicides to the soil.

Parent material

Parent material is the unconsolidated mass in which a soil forms. It determines the mineral and chemical composition of the soil and, to a large extent, the rate at which a soil forms. In Hanover County, the soils formed in residuum, Coastal Plain sediments, or recent alluvium.

Many of the soils on the Piedmont formed in the residuum of granite-gneiss, granite, hornblende gneiss, sandstone, shale, and mixed metamorphic and sedimentary rock. The soils that formed in residuum are generally strongly acid to very strongly acid, have a clayey subsoil, and, if well drained, are yellowish brown to red in the subsoil. Wedowee, Appling, Cecil, Pacolet, and Vance soils are examples. The soils that formed in the residuum of hornblende gneiss, however, have a more plastic and less acid subsoil. Vance and Helena soils are examples. The soils that formed in the residuum of sandstone and shale are very strongly acid to extremely acid and, within very small areas, range from yellowish brown to weak red in the subsoil. Mayodan, Creedmore, and Pinkston soils are examples. In an area near the town of Hylas, the soils formed in residuum of mixed metamorphic and sedimentary rock. These soils are generally more silty than the soils that formed in other Piedmont residua. They are quite variable in reaction and have a clayey subsoil that is very plastic to plastic. Orange and Georgeville soils are examples of soils that formed in residuum of mostly metamorphic rock.

The soils that formed in Coastal Plain sediments are generally loamy or medium textured, but, in three areas, two near Hanover and one near the New Kent County line, they are clayey. Norfolk and Suffolk soils are examples of the loamy soils. Caroline and Dunbar soils are examples of the clayey soils.

The soils on flood plains formed in water-laid material called recent alluvium. They are sandy to loamy and show little or no subsoil development. Tarboro and Chewacla soils are examples.

Relief

Hanover County is divided approximately in half by the Fall Line. The Piedmont Plateau is to the west of the Fall Line, and the Coastal Plain is to the east. Elevation ranges from slightly above sea level on the Coastal Plain to approximately 370 feet above sea level on the Piedmont.

The Piedmont generally has medium width ridges and sloping to very steep side slopes. However, there are broad ridges between the North Anna River and the Little River, as far west as the town of Hewlett, and between the Little River and the New Found River, as far west as the town of Coatsville. Most of the streams that flow through the Piedmont are in narrow valleys that have small flood plains and terraces.

The overall slope of the part of the Piedmont in the survey area averages 9 feet per mile. The dissected topography of the Piedmont was created by the action of highly erosive streams. Stream velocity on the Piedmont is generally high, and channel slopes average 3 feet per mile. The North Anna, Pamunkey, and Chickahominy Rivers generally flow to the southeast. Tributaries of the North Anna and Pamunkey Rivers generally flow to the northeast.

The Fall Line topography has characteristics of both the Piedmont and the Coastal Plain. The stream channels have a slope of approximately 10 feet per mile.

The Coastal Plain generally has broader ridges than the Piedmont or the fall zone. The side slopes are gener-

ally steep to very steep along the small streams, which have narrow bottoms. These small streams discharge into larger streams that have lower velocity and meander to the Pamunkey River. The valley floors along many of these larger streams are marshy and swampy. Stream velocities on the Coastal Plain are generally lower than those on the Piedmont and the Fall Line. The average channel slope of Coastal Plain streams is one foot per mile. These streams, therefore, are not active agents of erosion or sediment transport. Tributaries of the Pamunkey River are affected by tidal flow.

Hanover County lies within the James and York River Basins. Most of the streams flow into the Pamunkey River. The Pamunkey River is formed by the North Anna and South Anna Rivers. A small area in the south-central and southeastern part of the county drains into the James River Basin via the Chickahominy River.

Time

The formation of soils requires time for changes to take place in the parent materials. Younger soils have less well developed horizons than older soils. The soils in this survey area have developed since the Wisconsinan glaciation—a relatively short period in geologic time.

The soils that formed on flood plains receive new sediments with each flooding. These soils have only weak structure and weak differences in color between horizons. Chewacla soils are examples. Pamunkey soils and other soils that are not subject to this periodic flooding have better developed soil horizons.

Processes of soil horizon differentiation

Several processes are involved in the formation of the soil horizons. Among these processes are the accumulation of organic matter, the leaching of soluble salts, the reduction and transfer of iron, the formation of soil structure, and the formation and translocation of clay minerals. These are continuous and generally simultaneous processes that have been going on for thousands of years.

Organic matter accumulates as plant and animal material decomposes. It darkens the surface layer and helps to form the A1 horizon. Organic matter, once lost, normally takes a long time to replace. In the soils in Hanover County, the content of organic matter in the surface layer averages 2 percent.

Theoretically, in soils that have distinct subsoil horizons, some of the lime and other soluble salts were leached before the translocation of clay minerals. Among the factors that affect this leaching are the kinds of salts originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

Well drained and moderately well drained soils in Hanover County have red to yellowish brown subsoil horizons. These colors are caused mainly by thin coatings of iron oxides on sand and silt grains. In some soils—for example, some Creedmoor soils—the colors are inherited from the reddish brown sandstone parent material.

A fragipan has developed in Bourne and Colfax soils. Fragipans are very firm and brittle when moist and hard when dry. Soil particles are packed so tightly that bulk density is high and pore space is low. The genesis of these horizons is not fully understood, but studies indicate that the swelling and shrinking of soil in alternating wet and dry periods may account for the packing of the soil particles and also for a gross polygonal pattern of cracks in the fragipan. Clay, silica, and oxides of aluminum are the most likely cementing agents causing brittleness and hardness.

The reduction and transfer of iron occurs mainly in the wetter, more poorly drained soils. This process is called gleying. Moderately well drained to somewhat poorly drained soils have mottles of yellowish brown and strong brown and red, which indicate the segregation of iron. In poorly drained Roanoke, Coxville, Forestdale, and Worsham soils, the subsoil and underlying material are grayish, indicating reduction and transfer of iron in solution.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses.

Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	More than 12

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. Mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock. Bedrock is too near the surface for the specified use.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Mod-

erately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Krotovina. An irregular tubular streak within one horizon of material transported from another horizon. It is caused by the filling of tunnels made by burrowing animals in one horizon with material from outside the horizon.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to

permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables.) The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, differences in slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	Less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the low lands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size of diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION
[Recorded in the period 1951-74 at Ashland, Virginia]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	46.7	24.2	35.5	73	-3	64	2.63	1.71	3.45	6	2.9
February	49.0	26.4	35.7	73	5	212	3.14	1.93	4.23	7	4.7
March	58.4	33.6	43.8	82	15	419	3.21	2.70	3.88	7	1.5
April	69.4	43.2	56.4	89	24	492	3.00	1.88	4.00	6	.1
May	76.8	52.3	64.6	92	31	763	3.51	1.92	4.79	7	0
June	83.6	60.2	71.9	96	42	957	3.79	1.90	5.32	6	0
July	87.1	64.3	71.5	98	50	1,174	3.82	1.75	5.51	6	0
August	85.9	63.7	74.9	98	49	1,082	4.72	2.97	6.29	6	0
September	80.5	56.9	68.7	96	36	861	3.49	1.93	4.75	5	0
October	70.0	44.6	57.3	88	24	536	3.37	1.30	5.03	4	0
November	59.9	34.6	47.3	81	14	229	3.01	1.24	4.45	6	.1
December	49.5	27.1	38.3	73	4	139	3.34	1.59	4.75	6	1.6
Year	68.1	44.3	55.5	98	-5	6,928	41.03	35.13	47.99	72	10.9

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL
[Recorded in the period 1951-74 at Ashland, Virginia]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 22	April 25	May 10
2 years in 10 later than--	April 11	April 19	May 3
5 years in 10 later than--	March 22	April 7	April 20
First freezing temperature in fall:			
1 year in 10 earlier than--	October 29	October 16	October 4
2 years in 10 earlier than--	November 2	October 20	October 8
5 years in 10 earlier than--	November 9	October 29	October 16

TABLE 3.--GROWING SEASON
[Recorded in the period 1951-74 at Ashland, Virginia]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	196	179	153
8 years in 10	208	188	162
5 years in 10	232	204	179
2 years in 10	255	220	196
1 year in 10	268	229	205

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1B	Abell fine sandy loam, 2 to 7 percent slopes	7,020	2.3
2	Altavista fine sandy loam	2,820	0.9
3B	Appling fine sandy loam, 2 to 7 percent slopes	5,300	1.8
3C2	Appling fine sandy loam, 7 to 15 percent slopes, eroded	1,290	0.4
4B	Appling gravelly sandy loam, 2 to 7 percent slopes	260	0.1
4C	Appling gravelly sandy loam, 7 to 15 percent slopes	320	0.1
5C	Appling-Asnlar complex, 5 to 15 percent slopes	670	0.2
6	Aquults, nearly level	1,540	0.5
7	Atlee loam, 0 to 4 percent slopes	1,400	0.5
8	Augusta fine sandy loam	520	0.2
9	Bolling Variant gravelly sandy loam	610	0.2
10B	Bourne fine sandy loam, 2 to 7 percent slopes	5,510	1.8
10C	Bourne fine sandy loam, 7 to 15 percent slopes	370	0.1
11B	Bourne-Varina complex, 2 to 7 percent slopes	1,500	0.5
11C	Bourne-Varina complex, 7 to 15 percent slopes	1,100	0.4
12B	Caroline fine sandy loam, 2 to 7 percent slopes	640	0.2
12D2	Caroline fine sandy loam, 15 to 25 percent slopes, eroded	670	0.2
13B2	Caroline-Dogue complex, 2 to 7 percent slopes, eroded	890	0.3
13C2	Caroline-Dogue complex, 7 to 15 percent slopes, eroded	3,830	1.3
14B2	Cecil fine sandy loam, 2 to 7 percent slopes, eroded	7,090	2.4
14C2	Cecil fine sandy loam, 7 to 15 percent slopes, eroded	1,340	0.4
15B2	Cecil-Vance gravelly sandy loams, 2 to 7 percent slopes, eroded	3,460	1.1
15C2	Cecil-Vance gravelly sandy loams, 7 to 15 percent slopes, eroded	2,040	0.7
15D2	Cecil-Vance gravelly sandy loams, 15 to 25 percent slopes, eroded	410	0.1
16	Chewacla fine sandy loam	3,460	1.1
17B	Colfax fine sandy loam, 2 to 7 percent slopes	4,315	1.4
17C	Colfax fine sandy loam, 7 to 15 percent slopes	445	0.1
18	Coxville loam	5,520	1.8
19B	Creedmoor fine sandy loam, 2 to 7 percent slopes	600	0.2
20B	Creedmoor Variant fine sandy loam, 2 to 7 percent slopes	350	0.1
21B2	Cullen loam, 2 to 7 percent slopes, eroded	2,220	0.7
21C2	Cullen loam, 7 to 15 percent slopes, eroded	1,580	0.5
21D2	Cullen loam, 15 to 25 percent slopes, eroded	450	0.1
22	Dawhoo Variant fine sandy loam	210	0.1
23	Dogue loam	3,070	1.0
24	Dunbar fine sandy loam	3,980	1.3
25A	Duplin fine sandy loam, 0 to 2 percent slopes	2,280	0.8
25B	Duplin fine sandy loam, 2 to 7 percent slopes	3,840	1.3
26B	Edgehill Variant very gravelly sandy loam, 2 to 7 percent slopes	400	0.1
27B	Fluvanna silt loam, 2 to 7 percent slopes	1,170	0.4
27C2	Fluvanna silt loam, 7 to 15 percent slopes, eroded	765	0.3
28	Fluvaquents, nearly level	18,440	6.1
29	Forestdale loam	390	0.1
30	Forestdale loam, frequently flooded	1,690	0.6
31	Fork fine sandy loam	480	0.2
32B	Georgeville loam, 2 to 7 percent slopes	280	0.1
32C2	Georgeville loam, 7 to 20 percent slopes, eroded	190	0.1
33B	Goldsboro fine sandy loam, 0 to 4 percent slopes	760	0.3
34B	Goldsboro fine sandy loam, overwash, 0 to 4 percent slopes	2,220	0.7
35B	Helena-Colfax complex, 2 to 7 percent slopes	6,740	2.2
36C	Helena-Orange complex, 7 to 15 percent slopes	860	0.3
37	Hydraquents, nearly level	990	0.3
38C	Iredell-Orange complex, 7 to 15 percent slopes	850	0.3
39B	Kempsville gravelly fine sandy loam, 2 to 7 percent slopes	2,650	0.9
39C	Kempsville gravelly fine sandy loam, 7 to 15 percent slopes	640	0.2
40A	Kempsville-Bourne fine sandy loams, 0 to 2 percent slopes	490	0.2
40B	Kempsville-Bourne fine sandy loams, 2 to 7 percent slopes	6,270	2.1
41	Kenansville loamy sand, 2 to 7 percent slopes	2,760	0.9
42	Kenansville Variant loamy sand	350	0.1
43	Lenoir loam	630	0.2
44B	Masada fine sandy loam, 2 to 7 percent slopes	730	0.2
45B	Mayodan-Creedmoor complex, 2 to 7 percent slopes	1,395	0.5
46	Myatt Variant fine sandy loam	1,435	0.5
47A	Norfolk fine sandy loam, 0 to 2 percent slopes	3,560	1.2
47B	Norfolk fine sandy loam, 2 to 7 percent slopes	11,670	3.9
48B	Orange-Iredell complex, 2 to 7 percent slopes	1,840	0.6
49B	Orangeburg fine sandy loam, 2 to 7 percent slopes	2,300	0.8
50A	Orangeburg-Faceville fine sandy loams, 0 to 2 percent slopes	2,050	0.7
50B	Orangeburg-Faceville fine sandy loams, 2 to 7 percent slopes	10,930	3.6
50C	Orangeburg-Faceville fine sandy loams, 7 to 15 percent slopes	400	0.1
51B2	Pacolet fine sandy loam, 2 to 7 percent slopes, eroded	4,330	1.4
51C2	Pacolet fine sandy loam, 7 to 15 percent slopes, eroded	8,890	2.9

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
51D2	Pacolet fine sandy loam, 15 to 25 percent slopes, eroded	2,320	0.8
52C3	Pacolet clay loam, 7 to 15 percent slopes, severely eroded	540	0.2
53B	Pacolet-Cecil gravelly sandy loams, 2 to 7 percent slopes	410	0.1
53C2	Pacolet-Cecil gravelly sandy loams, 7 to 15 percent slopes, eroded	400	0.1
54B	Pamunkey loamy sand, 2 to 7 percent slopes	1,510	0.5
55A	Pamunkey fine sandy loam, 0 to 2 percent slopes	560	0.2
55B	Pamunkey fine sandy loam, 2 to 7 percent slopes	3,470	1.2
56	Pamunkey fine sandy loam, occasionally flooded	630	0.2
57B	Pamunkey Variant gravelly sandy loam, 0 to 4 percent slopes	1,215	0.4
58C	Pinkston-Mayodan sandy loams, 7 to 15 percent slopes	2,090	0.7
58D	Pinkston-Mayodan sandy loams, 15 to 25 percent slopes	1,840	0.6
58E	Pinkston-Mayodan sandy loams, 25 to 45 percent slopes	1,750	0.6
59	Pits,borrow	375	0.1
60	Pits, quarry	830	0.3
61	Rains fine sandy loam	570	0.2
62B	Spotsylvania-Bourne fine sandy loams, 2 to 7 percent slopes	4,295	1.4
62C	Spotsylvania-Bourne fine sandy loams, 7 to 15 percent slopes	1,990	0.7
63A	Suffolk loamy fine sand, 0 to 2 percent slopes	1,295	0.4
63B	Suffolk loamy fine sand, 2 to 7 percent slopes	8,250	2.7
63C	Suffolk loamy fine sand, 7 to 15 percent slopes	370	0.1
64B	Tarboro loamy sand, 2 to 7 percent slopes	1,080	0.4
65B	Turbeville fine sandy loam, 2 to 7 percent slopes	190	0.1
66C	Udalfs-Ochrepts complex, sloping	1,230	0.4
66D	Udalfs-Ochrepts complex, moderately steep	2,040	0.7
66F	Udalfs-Ochrepts complex, steep	2,415	0.8
67	Udifluvents, nearly level	480	0.2
68	Udorthents, smoothed	315	0.1
69C	Udults, sloping	2,430	0.8
69D	Udults, moderately steep	1,700	0.6
70B	Udults-Ochrepts complex, gently sloping	2,995	1.0
70C	Udults-Ochrepts complex, sloping	7,850	2.6
70D	Udults-Ochrepts complex, moderately steep	7,490	2.5
70E	Udults-Ochrepts complex, steep	7,420	2.5
70F	Udults-Ochrepts complex, very steep	3,240	1.1
71B	Vance fine sandy loam, 2 to 7 percent slopes	5,665	1.9
71C2	Vance fine sandy loam, 7 to 15 percent slopes, eroded	5,550	1.8
72B	Varina-Bourne complex, 2 to 7 percent slopes	920	0.3
73	Wahee loam	1,845	0.6
74B2	Wedowee fine sandy loam, 2 to 7 percent slopes, eroded	3,210	1.1
74C2	Wedowee fine sandy loam, 7 to 15 percent slopes, eroded	8,840	2.9
74D2	Wedowee fine sandy loam, 15 to 30 percent slopes, eroded	3,805	1.3
75C3	Wedowee clay loam, 7 to 15 percent slopes, severely eroded	320	0.1
75D3	Wedowee clay loam, 15 to 25 percent slopes, severely eroded	300	0.1
76D	Wedowee-Ashlar complex, 15 to 25 percent slopes	810	0.3
77	Wehadkee loam	2,520	0.8
78	Worsham fine sandy loam	5,320	1.8
	Water	4,285	1.4
	Total	301,440	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Corn silage	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
1B---- Abell	120	24	55	35	3.5	3.5	6.0
2---- Altavista	120	24	55	45	3.5	5.4	9.0
3B---- Appling	120	24	45	35	4.5	4.8	8.0
3C2---- Appling	95	19	40	30	3.5	4.5	7.3
4B---- Appling	95	19	45	35	4.0	4.8	8.0
4C---- Appling	80	16	40	30	3.0	4.5	7.3
5C---- Appling-Ashlar	75	12	45	---	2.5	3.3	5.5
6. Aquults							
7---- Atlee	90	18	50	30	3.0	3.5	6.0
8---- Augusta	100	20	---	40	---	6.0	10.0
9---- Bolling Variant	80	16	30	30	---	2.5	4.0
10B---- Bourne	80	16	50	30	---	2.5	4.0
10C---- Bourne	75	15	40	25	---	2.0	3.3
11B---- Bourne-Varina	90	18	---	34	---	2.5	4.0
11C---- Bourne-Varina	80	16	---	30	---	2.0	3.3
12B---- Caroline	110	22	60	40	3.5	2.5	4.0
12D2---- Caroline	---	---	---	---	2.5	2.0	3.3
13B2---- Caroline-Dogue	110	22	58	40	3.0	2.9	3.8
13C2---- Caroline-Dogue	90	18	38	30	---	2.2	2.9
14B2---- Cecil	120	24	45	35	4.5	3.2	5.5
14C2---- Cecil	100	20	40	30	3.5	2.8	4.6

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
15B2---------- Cecil-Vance	90	18	55	35	4.5	3.8	6.3
15C2---------- Cecil-Vance	85	17	50	30	4.0	3.2	5.2
15D2---------- Cecil-Vance	---	---	---	---	3.5	2.8	4.6
16---------- Chewacla	80	16	---	30	---	---	9.0
17B---------- Colfax	75	15	45	30	---	2.4	4.0
17C---------- Colfax	70	14	40	25	---	2.4	4.0
18---------- Coxville	---	---	---	---	---	---	6.0
19B---------- Creedmoor	95	19	---	---	---	3.0	5.0
20B---------- Creedmoor Variant	50	10	20	15	---	2.5	4.1
21B2---------- Cullen	130	26	80	45	4.8	3.8	6.3
21C2---------- Cullen	115	23	75	40	4.0	3.6	6.0
21D2---------- Cullen	90	18	60	30	3.0	3.0	5.0
22---------- Dawhoo Variant	---	---	---	---	---	---	3.0
23---------- Dogue	125	25	60	45	4.0	3.5	6.0
24---------- Dunbar	110	22	55	45	---	5.0	8.3
25A---------- Duplin	110	22	60	50	---	6.0	10.0
25B---------- Duplin	100	20	60	45	---	5.4	9.0
26B---------- Edgehill Variant	70	14	30	15	---	1.5	2.5
27B---------- Fluvanna	110	22	70	35	4.5	3.0	5.0
27C2---------- Fluvanna	100	20	60	30	3.5	3.0	5.0
28. Fluvaquents							
29** ---------- Forestdale	50	10	---	35	---	---	9.0
30---------- Forestdale	---	---	---	---	---	---	4.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
31--Fork	90	8	50	---	---	3.0	5.0
32B--Georgeville	120	24	45	35	4.5	3.2	5.5
32C2--Georgeville	95	19	35	25	3.0	2.5	4.0
33B, 34B--Goldsboro	115	23	60	40	---	5.4	9.0
35B--Helena-Colfax	75	15	---	---	---	3.0	5.0
36C--Helena-Orange	---	---	---	---	---	2.6	4.1
37. Hydraquents							
38C--Iredell-Orange	---	---	---	---	---	2.5	4.0
39B--Kempsville	110	26	80	45	4.5	3.5	6.0
39C--Kempsville	100	24	75	40	---	3.5	6.0
40A--Kempsville-Bourne	95	19	71	40	3.5	3.2	4.3
40B--Kempsville-Bourne	95	19	71	40	3.5	3.1	4.2
41--Kenansville	70	14	---	---	---	4.2	7.0
42--Kenansville Variant	70	14	20	35	---	3.5	6.0
43--Lenoir	90	18	---	40	---	6.0	10.0
44B--Masada	120	24	50	40	4.5	4.0	6.6
45B--Mayodan-Creedmoor	85	17	40	25	---	3.6	6.0
46--Myatt Variant	---	---	---	---	---	---	5.0
47A--Norfolk	110	22	60	40	4.0	6.3	10.5
47B--Norfolk	100	20	55	35	4.0	6.0	10.0
48B--Orange-Iredell	75	15	---	---	---	2.5	4.0
49B--Orangeburg	125	25	60	45	4.0	4.8	8.0
50A--Orangeburg-Faceville	125	25	60	50	4.0	5.1	8.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
50B---------- Orangeburg-Faceville	125	25	55	43	4.0	4.5	7.5
50C---------- Orangeburg-Faceville	110	22	45	28	3.0	3.5	6.0
51B2---------- Pacolet	100	20	40	30	4.0	3.2	5.5
51C2---------- Pacolet	90	18	35	25	3.0	2.8	4.6
51D2---------- Pacolet	---	---	---	---	---	2.5	4.2
52C3---------- Pacolet	50	---	---	---	---	2.0	3.3
53B---------- Pacolet-Cecil	85	---	---	---	---	3.0	5.0
53C2---------- Pacolet-Cecil	75	---	---	---	---	2.5	4.2
54B---------- Pamunkey	125	25	75	40	4.0	4.0	6.6
55A---------- Pamunkey	130	26	75	45	4.5	4.0	6.6
55B---------- Pamunkey	125	25	75	40	4.3	4.0	6.6
56---------- Pamunkey	120	24	---	35	---	4.0	6.6
57B---------- Pamunkey Variant	80	16	25	20	3.0	2.0	3.3
58C---------- Pinkston-Mayodan	75	16	---	---	---	3.5	5.7
58D---------- Pinkston-Mayodan	---	---	---	---	---	2.7	4.6
58E---------- Pinkston-Mayodan	---	---	---	---	---	---	2.4
59, 60. Pits							
61---------- Rains	---	---	---	---	---	---	6.0
62B---------- Spotsylvania-Bourne	100	20	53	30	3.8	3.3	5.5
62C---------- Spotsylvania-Bourne	90	18	45	25	3.0	2.8	4.6
63A---------- Suffolk	120	24	80	35	4.5	3.5	6.0
63B---------- Suffolk	120	24	80	30	4.5	3.5	6.0
63C---------- Suffolk	105	21	75	30	3.8	3.0	5.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Soybeans	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Ton	Bu	Bu	Ton	Ton	AUM*
64B---------- Tarboro	50	10	---	20	---	---	6.0
65B---------- Turbeville	120	24	50	40	4.5	4.0	8.5
66C, 66D, 66F. Udalfs-Ochrepts							
67. Udifluvents							
68. Udorthents							
69C, 69D. Udults							
70B, 70C, 70D, 70E, 70F. Udults-Ochrepts							
71B---------- Vance	80	16	60	35	3.5	4.8	8.0
71C2---------- Vance	75	15	55	30	3.0	4.8	8.0
72B---------- Varina-Bourne	90	18	---	36	---	2.5	4.0
73---------- Wahee	90	18	---	40	---	6.0	10.0
74B2---------- Wedowee	105	21	60	30	3.5	3.0	5.0
74C2---------- Wedowee	90	18	50	30	3.0	2.5	4.2
74D2---------- Wedowee	---	---	---	---	---	2.0	3.3
75C3, 75D3. Wedowee	---	---	35	---	---	2.0	3.2
76D---------- Wedowee-Ashlar	---	---	---	---	---	1.8	3.0
77---------- Wehadkee	---	---	---	---	---	---	8.5
78---------- Worsham	---	---	---	---	---	2.2	3.6

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** Yields are for areas protected from flooding.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
1B---------- Abell	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Loblolly pine------- Shortleaf pine------ Virginia pine-------	80 90 90 70 70	Loblolly pine, yellow-poplar, black walnut.
2---------- Altavista	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Longleaf pine------- Shortleaf pine------ Sweetgum---------- White oak----------	91 84 77 84 ---	Loblolly pine, yellow-poplar, black walnut, sweetgum, American sycamore.
3B, 3C2, 4B, 4C---- Appling	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Scarlet oak--------- Southern red oak---- Virginia pine------- White oak---------- Yellow-poplar-------	81 65 68 76 74 71 90	Eastern redcedar, loblolly pine, yellow-poplar.
5C*: Appling----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Scarlet oak--------- Southern red oak---- Virginia pine------- White oak---------- Yellow-poplar-------	81 65 68 76 74 71 90	Eastern redcedar, loblolly pine, yellow-poplar.
Ashlar----------	3o	Slight	Slight	Slight	Slight	Shortleaf pine------ Virginia pine------- Northern red oak----	55 65 70	Loblolly pine, Virginia pine, shortleaf pine.
7---------- Atlee	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Virginia pine------- Northern red oak----	75 70 70	Loblolly pine.
8---------- Augusta	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Sweetgum---------- American sycamore--- White oak---------- Southern red oak---- Water oak---------- Shortleaf pine------	92 90 90 80 80 --- ---	Loblolly pine, sweetgum, American sycamore, yellow-poplar.
9---------- Bolling Variant	2s	Slight	Slight	Moderate	Slight	Northern red oak---- Virginia pine------- Yellow-poplar------- Shortleaf pine------	80 80 90 80	Yellow-poplar, loblolly pine.
10B, 10C---------- Bourne	4w	Slight	Moderate	Slight	Moderate	Loblolly pine------- Northern red oak---- Virginia pine-------	70 65 70	Loblolly pine, Virginia pine.
11B*, 11C*: Bourne----------	4w	Slight	Moderate	Slight	Moderate	Loblolly pine------- Northern red oak---- Virginia pine-------	70 65 70	Loblolly pine, Virginia pine.
Varina----------	3o	Slight	Slight	Slight	Slight	Loblolly pine-------	85	Loblolly pine.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
12B---------- Caroline	3o	Slight	Slight	Slight	Slight	Shortleaf pine------ Virginia pine------- Loblolly pine------- Northern red oak----	70 70 75 70	Loblolly pine, Virginia pine.
12D2---------- Caroline	3r	Severe	Moderate	Slight	Slight	Shortleaf pine------ Virginia pine------- Loblolly pine------- Northern red oak----	70 70 75 70	Loblolly pine, Virginia pine.
13B2*: Caroline----------	3o	Slight	Slight	Slight	Slight	Shortleaf pine------ Virginia pine------- Loblolly pine------- Northern red oak----	70 70 75 70	Loblolly pine, Virginia pine.
Dogue----------	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Northern red oak---- Sweetgum---------- Yellow-poplar------- Southern red oak----	90 80 90 90 80	Loblolly pine.
13C2*: Caroline----------	3r	Moderate	Slight	Slight	Slight	Shortleaf pine------ Virginia pine------- Loblolly pine------- Northern red oak----	70 70 75 70	Loblolly pine, Virginia pine.
Dogue----------	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Northern red oak---- Sweetgum---------- Yellow-poplar------- Southern red oak----	90 80 90 90 80	Loblolly pine.
14B2, 14C2--------- Cecil	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Black oak---------- Northern red oak---- Post oak---------- Scarlet oak---------	80 69 73 66 82 65 80	Loblolly pine, yellow-poplar.
15B2*, 15C2*: Cecil----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Black oak---------- Northern red oak---- Post oak---------- Scarlet oak---------	80 69 73 66 82 65 80	Loblolly pine, yellow-poplar.
Vance----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Northern red oak---- Shortleaf pine------ White oak----------	76 --- --- ---	Loblolly pine, Virginia pine, yellow-poplar.
15D2*: Cecil----------	3r	Moderate	Moderate	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Black oak---------- Northern red oak---- Post oak---------- Scarlet oak---------	80 69 73 66 82 65 80	Loblolly pine, yellow-poplar.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
15D2*:								
Vance	3o	Slight	Slight	Slight	Slight	Loblolly pine	76	Loblolly pine, Virginia pine, yellow-poplar.
						Northern red oak	---	
						Shortleaf pine	---	
						White oak	---	
16 Chewacla	1w	Slight	Moderate	Moderate	Slight	Loblolly pine	96	Loblolly pine, American sycamore, yellow-poplar, sweetgum, green ash.
						Yellow-poplar	104	
						American sycamore	90	
						Sweetgum	97	
						Water oak	86	
						Green ash	97	
						Southern red oak	90	
17B, 17C Colfax	3w	Slight	Moderate	Slight	Slight	Loblolly pine	80	Loblolly pine, Virginia pine, sweetgum.
						Red maple	65	
						Shortleaf pine	70	
						Sweetgum	80	
						Yellow-poplar	80	
18 Coxville	2w	Slight	Severe	Severe	Moderate	Loblolly pine	90	Loblolly pine, sweetgum, American sycamore.
						Sweetgum	90	
						Water oak	90	
						Willow oak	---	
19B Creedmoor	3w	Slight	Moderate	Slight	Slight	Loblolly pine	84	Loblolly pine, sweetgum, yellow-poplar.
						Shortleaf pine	55	
						Sweetgum	---	
						Water oak	---	
20B Creedmoor Variant	2w	Slight	Moderate	Moderate	Slight	Loblolly pine	90	Loblolly pine, Virginia pine, yellow-poplar, sweetgum.
						Virginia pine	70	
						White oak	80	
						Northern red oak	80	
						Sweetgum	90	
21B2, 21C2 Cullen	3o	Slight	Slight	Slight	Slight	Loblolly pine	80	Loblolly pine.
						Shortleaf pine	70	
						Virginia pine	70	
						Yellow-poplar	80	
						White oak	60	
						Northern red oak	70	
21D2 Cullen	3r	Moderate	Moderate	Slight	Slight	Loblolly pine	80	Loblolly pine.
						Shortleaf pine	70	
						Virginia pine	70	
						Yellow-poplar	80	
						White oak	60	
						Northern red oak	70	
22 Dawhoo Variant	1w	Slight	Severe	Severe	Slight	Loblolly pine	100	Loblolly pine, yellow-poplar, green ash, sweetgum.
						Sweetgum	90	
						Yellow-poplar	95	
						Willow oak	90	
						Green ash	95	
23 Dogue	2w	Slight	Moderate	Slight	Slight	Loblolly pine	90	Loblolly pine.
						Northern red oak	80	
						Sweetgum	90	
						Yellow-poplar	90	
						Southern red oak	80	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
24---------- Dunbar	2w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Water oak---------- Yellow-poplar------- Sweetgum----------	90 --- --- 90	Loblolly pine, sweetgum, yellow-poplar.
25A, 25B---------- Duplin	2w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Sweetgum---------- Blackgum---------- Southern red oak----- White oak---------- Yellow-poplar-------	90 90 --- --- --- 100	Loblolly pine, yellow-poplar, American sycamore, sweetgum.
26B---------- Edgehill Variant	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Virginia pine------- Northern red oak----- Yellow-poplar-------	70 60 60 ---	Virginia pine, loblolly pine, yellow-poplar.
27B, 27C2---------- Fluvanna	3o	Slight	Slight	Slight	Slight	Virginia pine------- Shortleaf pine------ Northern red oak-----	74 63 70	Loblolly pine, Virginia pine.
29, 30---------- Forestdale	1w	Slight	Severe	Moderate	Slight	Green ash---------- Willow oak---------- Sweetgum----------	80 95 95	Green ash, sweetgum, American sycamore.
31---------- Fork	2w	Slight	Moderate	Slight	Slight	Northern red oak----- Virginia pine------- Shortleaf pine------ Loblolly pine------- Sweetgum---------- Yellow-poplar-------	80 80 80 90 90 90	Loblolly pine, yellow-poplar, sweetgum, Virginia pine.
32B, 32C2---------- Georgeville	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shorteaf pine------- White oak---------- Scarlet oak--------- Southern red oak-----	81 63 69 70 67	Loblolly pine, Virginia pine, eastern redcedar, black walnut, yellow-poplar.
33B, 34B---------- Goldsboro	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Sweetgum---------- Southern red oak----- White oak----------	90 90 --- ---	Loblolly pine, yellow-poplar, American sycamore, sweetgum.
35B*: Helena----------	3w	Slight	Moderate	Slight	Slight	Loblolly pine------- Shortleaf pine------ White oak---------- Yellow-poplar-------	80 63 64 87	Loblolly pine, Virginia pine, yellow-poplar.
Colfax----------	3w	Slight	Moderate	Slight	Slight	Loblolly pine------- Red maple---------- Shortleaf pine------ Sweetgum---------- Yellow-poplar-------	80 65 70 80 80	Loblolly pine, Virginia pine, sweetgum.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
36C*:								
Helena	3w	Slight	Moderate	Slight	Slight	Loblolly pine	80	Loblolly pine, Virginia pine, yellow-poplar.
						Shortleaf pine	63	
						White oak	64	
						Yellow-poplar	87	
Orange	4w	Moderate	Moderate	Moderate	Moderate	Northern red oak	60	Loblolly pine, Virginia pine.
						Virginia pine	60	
						Shortleaf pine	60	
						Loblolly pine	70	
38C*:								
Iredell	4c	Slight	Moderate	Moderate	Slight	Loblolly pine	67	Loblolly pine, eastern redcedar.
						Shortleaf pine	58	
						Post oak	44	
						White oak	47	
Orange	4w	Moderate	Moderate	Moderate	Moderate	Northern red oak	60	Loblolly pine, Virginia pine.
						Virginia pine	60	
						Shortleaf pine	60	
						Loblolly pine	70	
39B, 39C Kempsville	3o	Slight	Slight	Slight	Slight	Northern red oak	70	Loblolly pine.
						Loblolly pine	73	
						Virginia pine	70	
40A*, 40B*:								
Kempsville	3o	Slight	Slight	Slight	Slight	Northern red oak	70	Loblolly pine.
						Loblolly pine	73	
						Virginia pine	70	
Bourne	4w	Slight	Moderate	Slight	Moderate	Loblolly pine	70	Loblolly pine, Virginia pine.
						Northern red oak	65	
						Virginia pine	70	
41 Kenansville	3s	Slight	Moderate	Moderate	Slight	Loblolly pine	80	Loblolly pine.
42 Kenansville Variant	2s	Slight	Moderate	Moderate	Slight	Loblolly pine	90	Loblolly pine.
43 Lenoir	2w	Slight	Moderate	Moderate	Slight	Loblolly pine	90	Loblolly pine, sweetgum, American sycamore.
						Sweetgum	90	
						Southern red oak	---	
						White oak	---	
44B Masada	3o	Slight	Slight	Slight	Slight	Northern red oak	70	Virginia pine, loblolly pine, yellow-poplar.
						Virginia pine	70	
						Shortleaf pine	70	
						Yellow-poplar	85	
45B*:								
Mayodan	3o	Slight	Slight	Slight	Slight	Loblolly pine	82	Loblolly pine, Virginia pine, yellow-poplar.
						Shortleaf pine	75	
						Yellow-poplar	79	
Creedmoor	3w	Slight	Moderate	Slight	Slight	Loblolly pine	84	Loblolly pine, sweetgum, yellow-poplar.
						Shortleaf pine	55	
						Sweetgum	---	
						Water oak	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
46---------- Myatt Variant	2w	Slight	Severe	Severe	Moderate	Loblolly pine------- Sweetgum---------- American sycamore--- Northern red oak----- White oak-----------	90 90 90 80 80	Loblolly pine, sweetgum, yellow-poplar, American sycamore.
47A, 47B---------- Norfolk	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	86	Loblolly pine,
48B*: Orange----------	4w	Slight	Moderate	Moderate	Moderate	Northern red oak---- Virginia pine------- Shortleaf pine------ Loblolly pine-------	60 60 60 70	Loblolly pine, Virginia pine.
Iredell----------	4c	Slight	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Post oak---------- White oak-----------	67 58 44 47	Loblolly pine, eastern redcedar.
49B---------- Orangeburg	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	86	Loblolly pine.
50A*, 50B*, 50C*: Orangeburg--------	2o	Slight	Slight	Slight	Slight	Loblolly pine-------	86	Loblolly pine.
Faceville---------	3o	Slight	Slight	Slight	Slight	Loblolly pine-------	82	Loblolly pine.
51B2, 51C2-------- Pacolet	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	78 70 90	Loblolly pine, shortleaf pine, yellow-poplar.
51D2---------- Pacolet	3r	Moderate	Moderate	Slight	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	78 70 90	Loblolly pine, shortleaf pine, yellow-poplar.
52C3---------- Pacolet	4c	Moderate	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	70 60 80	Loblolly pine, shortleaf pine, yellow-poplar.
53B*, 53C2*: Pacolet----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	78 70 90	Loblolly pine, shortleaf pine, yellow-poplar.
Cecil----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Black oak---------- Northern red oak---- Post oak---------- Scarlet oak---------	80 69 73 66 82 65 80	Loblolly pine, yellow-poplar.
54B, 55A, 55B, 56-- Pamunkey	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Virginia pine------- Shortleaf pine------	80 90 80 80	Loblolly pine, black walnut, yellow-poplar.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
57B---------- Pamunkey Variant	2s	Slight	Slight	Moderate	Slight	American sycamore--- Sweetgum---------- Loblolly pine------- Yellow-poplar-------	90 90 90 100	Loblolly pine, yellow-poplar.
58C*:								
Pinkston----------	4d	Moderate	Moderate	Severe	Moderate	Northern red oak---- Virginia pine-------	60 60	Loblolly pine, Virginia pine.
Mayodan----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	82 75 79	Loblolly pine, Virginia pine, yellow-poplar.
58D*:								
Pinkston----------	4d	Severe	Severe	Severe	Moderate	Northern red oak---- Virginia pine-------	60 60	Loblolly pine, Virginia pine.
Mayodan----------	3r	Moderate	Moderate	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	82 75 79	Loblolly pine, Virginia pine, yellow-poplar.
58E*:								
Pinkston----------	4d	Severe	Severe	Severe	Moderate	Northern red oak---- Virginia pine-------	60 60	Loblolly pine, Virginia pine.
Mayodan----------	3r	Severe	Severe	Moderate	Slight	Loblolly pine------- Shortleaf pine------ Yellow-poplar-------	82 75 79	Loblolly pine, Virginia pine, yellow-poplar.
61---------- Rains	2w	Slight	Severe	Severe	Moderate	Loblolly pine------- Sweetgum----------	94 90	Loblolly pine, sweetgum, American sycamore.
62B*, 62C*:								
Spotsylvania------	4o	Slight	Slight	Slight	Slight	Shortleaf pine------ Loblolly pine------- Virginia pine------- Northern red oak----	55 70 60 60	Virginia pine, loblolly pine.
Bourne----------	4w	Slight	Moderate	Slight	Moderate	Loblolly pine------- Northern red oak---- Virginia pine-------	70 65 70	Loblolly pine, Virginia pine.
63A, 63B, 63C------ Suffolk	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Northern red oak----	80 70	Loblolly pine.
64B---------- Tarboro	3s	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	Loblolly pine.
65B---------- Turbeville	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Yellow-poplar------- Virginia pine------- Shortleaf pine------ Northern red oak----	80 85 70 70 70	Loblolly pine, yellow-poplar, Virginia pine.
71B, 71C2---------- Vance	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Northern red oak---- Shortleaf pine------ White oak----------	76 --- --- ---	Loblolly pine, Virginia pine, yellow-poplar.
72B*:								
Varina----------	3o	Slight	Slight	Slight	Slight	Loblolly pine-------	85	Loblolly pine.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
72B*:								
Bourne	4w	Slight	Moderate	Slight	Moderate	Loblolly pine	70	Loblolly pine,
						Northern red oak	65	Virginia pine.
						Virginia pine	70	
73	2w	Slight	Moderate	Moderate	Slight	Loblolly pine	86	Loblolly pine,
Wahee						Sweetgum	90	sweetgum,
								American sycamore,
								water oak.
74B2, 74C2	3o	Slight	Slight	Slight	Slight	Loblolly pine	80	Loblolly pine,
Wedowee						Virginia pine	70	Virginia pine,
						Shortleaf pine	70	eastern redcedar,
						Southern red oak	70	yellow-poplar.
						Northern red oak	70	
						White oak	65	
74D2	3r	Moderate	Moderate	Slight	Slight	Loblolly pine	80	Loblolly pine,
Wedowee						Virginia pine	70	Virginia pine,
						Shortleaf pine	70	eastern redcedar,
						Southern red oak	70	yellow-poplar.
						Northern red oak	70	
						White oak	65	
75C3	4c	Moderate	Moderate	Moderate	Slight	Loblolly pine	70	Loblolly pine,
Wedowee						Shortleaf pine	60	shortleaf pine,
						Virginia pine	60	Virginia pine.
75D3	4c	Severe	Severe	Moderate	Slight	Loblolly pine	70	Loblolly pine,
Wedowee						Shortleaf pine	60	shortleaf pine,
						Virginia pine	60	Virginia pine.
76D*:								
Wedowee	3r	Moderate	Moderate	Slight	Slight	Loblolly pine	80	Loblolly pine,
						Virginia pine	70	Virginia pine,
						Shortleaf pine	70	eastern redcedar,
						Southern red oak	70	yellow-poplar.
						Northern red oak	70	
						White oak	65	
Ashlar	3r	Moderate	Moderate	Slight	Slight	Shortleaf pine	55	Loblolly pine,
						Virginia pine	65	Virginia pine,
						Northern red oak	70	shortleaf pine.
77	1w	Slight	Severe	Severe	Moderate	Loblolly pine	102	Loblolly pine,
Wehadkee						Sweetgum	93	American sycamore,
						Yellow-poplar	98	yellow-poplar,
						Willow oak	90	green ash,
						Green ash	96	sweetgum.
						Water oak	86	
						White ash	88	
78	2w	Slight	Severe	Severe	Slight	Northern red oak	80	Loblolly pine.
Worsham						Shortleaf pine	65	
						Virginia pine	70	
						Loblolly pine	80	
						Pin oak	85	

*This map unit is made up of two or more soils. See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1B Abell	Slight	Slight	Moderate: slope.	Slight	Slight.
2 Altavista	Severe: floods.	Slight	Moderate: wetness.	Slight	Slight.
3B Appling	Slight	Slight	Moderate: slope.	Slight	Slight.
3C2 Appling	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
4B Appling	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones.
4C Appling	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope.
5C*: Appling	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Ashlar	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: depth to rock.
6*. Aquults					
7 Atlee	Moderate: percs slowly, wetness.	Slight	Moderate: percs slowly, wetness.	Slight	Slight.
8 Augusta	Severe: wetness, floods.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
9 Bolling Variant	Moderate: wetness, small stones.	Moderate: wetness, small stones.	Severe: small stones.	Moderate: small stones.	Slight.
10B Bourne	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
10C Bourne	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.	Moderate: slope.
11B*: Bourne	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
Varina	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Slight.
11C*: Bourne	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.	Moderate: slope.
Varina	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: slope.
12B Caroline	Moderate: percs slowly.	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
12D2 Caroline	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
13B2*: Caroline	Moderate: percs slowly.	Slight	Moderate: slope.	Slight	Slight.
Dogue	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
13C2*: Caroline	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Dogue	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
14B2 Cecil	Slight	Slight	Moderate: slope.	Slight	Slight.
14C2 Cecil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
15B2*: Cecil	Moderate: small stones.	Slight	Moderate: slope.	Slight	Moderate: small stones.
Vance	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Moderate: small stones.
15C2*: Cecil	Moderate: slope, small stones.	Moderate: slope.	Severe: slope.	Slight	Moderate small stones, slope.
Vance	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight	Moderate: small stones. slope.
15D2*: Cecil	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Vance	Severe: slope.	Severe: slope.	Severe: slope, percs slowly.	Moderate: slope.	Severe: slope.
16 Chewacla	Severe: floods, wetness.	Moderate: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
17B Colfax	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: slope, percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
17C Colfax	Moderate: slope, percs slowly, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.
18 Coxville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
19B Creedmoor	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Moderate: wetness.
20B Creedmoor Variant	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
21B2 Cullen	Slight	Slight	Moderate: slope.	Slight	Slight.
21C2 Cullen	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
21D2 Cullen	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
22 Dawhoo Variant	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
23 Dogue	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Slight.
24 Dunbar	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
25A Duplin	Moderate: percs slowly, wetness.	Slight	Moderate: wetness, percs slowly.	Slight	Slight.
25B Duplin	Moderate: percs slowly, wetness.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
26B Edgehill Variant	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
27B Fluvanna	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
27C2 Fluvanna	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
28*. Fluvaquents					
29 Forestdale	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
30 Forestdale	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.
31 Fork	Severe: floods.	Moderate: wetness, floods.	Moderate: wetness, floods.	Moderate: wetness, floods.	Moderate: wetness, floods.
32B Georgeville	Slight	Slight	Moderate: slope.	Slight	Slight.
32C2 Georgeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
33B, 34B---------- Goldsboro	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
35B*:					
Helena----------	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
Colfax----------	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: slope, percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
36C*:					
Helena----------	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.
Orange----------	Moderate: percs slowly, wetness, slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.
37*. Hydraquents					
38C*:					
Iredell----------	Severe: wetness.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.	Moderate: slope, wetness.
Orange----------	Moderate: percs slowly, wetness, slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.
39B---------- Kempsville	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Slight.
39C---------- Kempsville	Severe: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Moderate: slope.
40A*:					
Kempsville----------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
Bourne----------	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
40B*:					
Kempsville----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Bourne----------	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
41---------- Kenansville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: too sandy.
42---------- Kenansville Variant	Severe: floods.	Moderate: floods, too sandy.	Severe: too sandy.	Moderate: too sandy.	Moderate: floods, too sandy.
43---------- Lenoir	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
44B---------- Masada	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
45B*:					
Mayodan----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Creedmoor----------	Moderate: percs slowly.	Slight----------	Moderate: percs slowly.	Slight----------	Slight.
46---------- Myatt Variant	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness, floods.
47A---------- Norfolk	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
47B---------- Norfolk	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
48B*:					
Orange----------	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Iredell----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
49B---------- Orangeburg	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
50A*:					
Orangeburg----------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
Faceville----------	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
50B*:					
Orangeburg----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Faceville----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
50C*:					
Orangeburg----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Faceville----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
51B2---------- Pacolet	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
51C2---------- Pacolet	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
51D2---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
52C3---------- Pacolet	Moderate: too clayey, slope.	Moderate: too clayey, slope.	Severe: slope.	Moderate: too clayey.	Moderate: too clayey, slope.
53B*:					
Pacolet----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: small stones.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
53B*:					
Cecil	Moderate: small stones.	Slight	Moderate: slope.	Slight	Moderate: small stones.
53C2*:					
Pacolet	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope.
Cecil	Moderate: slope, small stones.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope.
54B Pamunkey	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope.	Moderate: too sandy.	Moderate: too sandy.
55A Pamunkey	Slight	Slight	Slight	Slight	Slight.
55B Pamunkey	Slight	Slight	Moderate: slope.	Slight	Slight.
56 Pamunkey	Severe: floods.	Moderate: floods.	Moderate: small stones, floods.	Slight	Moderate: floods.
57B Pamunkey Variant	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Slight.
58C*:					
Pinkston	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Mayodan	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
58D*:					
Pinkston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Mayodan	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
58E*:					
Pinkston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mayodan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
59*, 60*. Pits					
61 Rains	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
62B*:					
Spotsylvania	Slight	Slight	Moderate: slope.	Slight	Slight.
Bourne	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
62C*:					
Spotsylvania	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
62C*: Bourne	Severe: percs slowly.	Moderate: slope, wetness.	Severe: slope, wetness.	Moderate: wetness.	Moderate: slope.
63A Suffolk	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.
63B Suffolk	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: too sandy.
63C Suffolk	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: slope, too sandy.
64B Tarboro	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope.	Moderate: too sandy.	Severe: too sandy.
65B Turbeville	Slight	Slight	Moderate: slope.	Slight	Slight.
66C*, 66D*, 66F*: Udalfs. Ochrepts.					
67*. Udifluvents					
68*. Udorthents					
69C*, 69D*. Udults					
70B*, 70C*, 70D*, 70E*, 70F*: Udults. Ochrepts.					
71B Vance	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Slight.
71C2 Vance	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight	Moderate: slope.
72B*: Varina	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Slight.
Bourne	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight.
73 Wahee	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: floods, wetness.
74B2 Wedowee	Slight	Slight	Moderate: slope.	Slight	Slight.
74C2 Wedowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
74D2---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
75C3---------- Wedowee	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.	Moderate: too clayey, slope.
75D3---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.
76D*: Wedowee----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Ashlar----------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
77---------- Wehadkee	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.
78---------- Worsham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1B---------- Abell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
2---------- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3B---------- Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
3C2---------- Appling	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
4B---------- Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4C---------- Appling	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
5C*:										
Appling----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ashlar----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
6*. Aquults										
7---------- Atlee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Very poor.
8---------- Augusta	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
9---------- Bolling Variant	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
10B---------- Bourne	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
10C---------- Bourne	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
11B*:										
Bourne----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
Varina----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
11C*:										
Bourne----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Varina----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
12B---------- Caroline	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
12D2---------- Caroline	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
13B2*:										
Caroline	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Dogue	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
13C2*:										
Caroline	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Dogue	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
14B2 Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
14C2 Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
15B2*:										
Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Vance	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
15C2*:										
Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Vance	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
15D2*:										
Cecil	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Vance	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
16 Chewacla	Very poor.	Poor	Poor	Good	Good	Fair	Fair	Poor	Good	Fair.
17B Colfax	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
17C Colfax	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
18 Coxville	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
19B Creedmoor	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20B Creedmoor Variant	Fair	Good	Good	Good	Good	Fair	Very poor.	Good	Good	Poor.
21B2 Cullen	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
21C2 Cullen	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
21D2---------- Cullen	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
22---------- Dawhoo Variant	Very poor.	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
23---------- Dogue	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
24---------- Dunbar	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
25A---------- Duplin	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
25B---------- Duplin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
26B---------- Edgehill Variant	Fair	Fair	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor	Very poor.
27B---------- Fluvanna	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27C2---------- Fluvanna	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
28*. Fluvaquents										
29---------- Forestdale	Fair	Fair	Good	Fair	---	Good	Good	Fair	Fair	Good.
30---------- Forestdale	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
31---------- Fork	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
32B, 32C2---------- Georgeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
33B, 34B---------- Goldsboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
35B*: Helena----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Colfax----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
36C*: Helena----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Orange----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
37*. Hydraquents										
38C*: Iredell----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
38C*:										
Orange	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
39B---- Kempsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
39C---- Kempsville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
40A*:										
Kempsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bourne	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor.
40B*:										
Kempsville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bourne	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
41---- Kenansville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
42---- Kenansville Variant	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Poor.
43---- Lenoir	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
44B---- Masada	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45B*:										
Mayodan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Creedmoor	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
46---- Myatt Variant	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
47A, 47B---- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
48B*:										
Orange	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Iredell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
49B---- Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
50A*:										
Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Faceville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
50B*:										
Orangeburg	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Faceville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
50C*:										
Orangeburg	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Faceville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
51B2, 51C2 Pacolet	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
51D2 Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
52C3 Pacolet	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
53B*:										
Pacolet	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
53C2*:										
Pacolet	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
54B Pamunkey	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
55A, 55B, 56 Pamunkey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
57B Pamunkey Variant	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
58C*:										
Pinkston	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
Mayodan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
58D*:										
Pinkston	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Mayodan	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
58E*:										
Pinkston	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Mayodan	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
59*, 60*. Pits										
61---------- Rains	Very poor.	Very poor.	Very poor.	Fair	Fair	Good	Good	Very poor.	Poor	Good.
62B*:										
Spotsylvania------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bourne----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
62C*:										
Spotsylvania------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bourne----------	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
63A, 63B---------- Suffolk	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
63C---------- Suffolk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
64B---------- Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
65B---------- Turbeville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
66C*, 66D*, 66F*: Udalfs.										
Ochrepts.										
67*. Udifluvents										
68*. Udorthents										
69C*, 69D*. Udults										
70B*, 70C*, 70D*, 70E*, 70F*: Udults.										
Ochrepts.										
71B---------- Vance	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
71C2---------- Vance	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
72B*:										
Varina----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bourne----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
73---------- Wahee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
74B2---------- Wedowee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
74C2---------- Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
74D2---------- Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
75C3---------- Wedowee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
75D3---------- Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
76D*:										
Wedowee----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ashlar----------	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
77---------- Wehadkee	Very poor.	Poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
78---------- Worsham	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1B Abell	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: low strength.	Slight.
2 Altavista	Severe: wetness, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: low strength.	Slight.
3B Appling	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Slight	Slight.
3C2 Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
4B Appling	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones.
4C Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
5C*: Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Ashlar	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock.	Moderate: depth to rock.
6*. Aquults						
7 Atlee	Moderate: wetness, too clayey.	Moderate: wetness, low strength, shrink-swell.	Severe: wetness.	Moderate: wetness, low strength.	Moderate: low strength.	Slight.
8 Augusta	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness.	Moderate: wetness.
9 Bolling Variant	Severe: small stones, wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Slight	Slight.
10B Bourne	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.
10C Bourne	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope, wetness.	Moderate: slope, low strength.	Moderate: slope.
11B*: Bourne	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.
Varina	Slight	Slight	Moderate: wetness.	Moderate: slope.	Moderate: low strength.	Slight.
11C*: Bourne	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope, wetness.	Moderate: slope, low strength.	Moderate: slope.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
11C*:						
Varina	Moderate: slope.	Moderate: slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: low strength.	Moderate: slope.
12B	Severe: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Slight.
12D2	Severe: slope, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
13B2*:						
Caroline	Severe: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Slight.
Dogue	Severe: wetness, too clayey.	Severe: low strength.	Severe: wetness, low strength.	Severe: low strength.	Severe: low strength.	Slight.
13C2*:						
Caroline	Severe: too clayey.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
Dogue	Severe: wetness, too clayey.	Severe: low strength.	Severe: wetness, low strength.	Severe: slope, low strength.	Severe: low strength.	Moderate: slope.
14B2	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.	Slight.
14C2	Moderate: too clayey, slope.	Moderate: slope, shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Moderate: slope.
15B2*:						
Cecil	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.	Moderate: small stones.
Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Moderate: small stones.
15C2*:						
Cecil	Moderate: too clayey, slope.	Moderate: slope, shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Moderate: small stones, slope.
Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: slope, low strength.	Severe: low strength.	Moderate: small stones, slope.
15D2*:						
Cecil	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Vance	Severe: too clayey, slope.	Severe: low strength, slope.	Severe: low strength, slope.	Severe: slope, low strength.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
16---------- Chewacla	Severe: wetness, floods.	Severe: floods, wetness, low strength.	Severe: floods, wetness.	Severe: floods, wetness, low strength.	Severe: wetness, floods, low strength.	Severe: floods.
17B---------- Colfax	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
17C---------- Colfax	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Moderate: slope, wetness.
18---------- Coxville	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness.
19B---------- Creedmoor	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Moderate: wetness.
20B---------- Creedmoor Variant	Severe: wetness, too clayey.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
21B2---------- Cullen	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: low strength.	Slight.
21C2---------- Cullen	Moderate: too clayey, slope.	Moderate: slope, low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
21D2---------- Cullen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
22---------- Dawhoo Variant	Severe: wetness, floods, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
23---------- Dogue	Severe: wetness, too clayey.	Severe: low strength.	Severe: wetness, low strength.	Severe: low strength.	Severe: low strength.	Slight.
24---------- Dunbar	Severe: wetness, too clayey.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Slight.
25A, 25B---------- Duplin	Moderate: too clayey, wetness.	Moderate: low strength, shrink-swell.	Severe: wetness, shrink-swell, low strength.	Moderate: wetness, shrink-swell, low strength.	Severe: low strength.	Slight.
26B---------- Edgehill Variant	Severe: small stones.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones.
27B---------- Fluvanna	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Slight.
27C2---------- Fluvanna	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: slope, low strength.	Severe: low strength.	Moderate: slope.
28*. Fluvaquents						

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
29---------- Forestdale	Severe: too clayey, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: wetness.
30---------- Forestdale	Severe: floods, too clayey, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: floods, shrink-swell, wetness.	Severe: wetness, floods.
31---------- Fork	Severe: wetness, floods.	Severe: floods.	Severe: wetness, floods.	Severe: floods.	Severe: floods.	Moderate: wetness, floods.
32B---------- Georgeville	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
32C2---------- Georgeville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
33B, 34B---------- Goldsboro	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: wetness.	Slight---------	Slight.
35B*:						
Helena----------	Severe: too clayey.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, low strength.	Moderate: wetness.
Colfax----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
36C*:						
Helena----------	Severe: too clayey.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, slope, wetness.	Severe: shrink-swell, low strength.	Moderate: slope, wetness.
Orange----------	Severe: too clayey, wetness.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, shrink-swell.	Severe: slope, shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: slope, wetness.
37*. Hydraquents						
38C*:						
Iredell----------	Severe: too clayey, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: slope, shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: slope, wetness.
Orange----------	Severe: too clayey, wetness.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, shrink-swell.	Severe: slope, shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: slope, wetness.
39B---------- Kempsville	Moderate: small stones.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Slight.
39C---------- Kempsville	Moderate: slope, small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.	Moderate: slope.
40A*:						
Kempsville--------	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: low strength.	Slight.
Bourne----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
40B*:						
Kempsville	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
Bourne	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.
41--- Kenansville	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: too sandy.
42--- Kenansville Variant	Severe: floods, wetness, cutbanks cave.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Moderate: floods, too sandy.
43--- Lenoir	Severe: wetness, too clayey.	Severe: wetness, too clayey.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
44B--- Masada	Severe: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: too clayey.	Slight.
45B*:						
Mayodan	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.	Slight.
Creedmoor	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Slight.
46--- Myatt Variant	Severe: wetness, floods, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods, low strength.	Severe: wetness, floods.
47A--- Norfolk	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
47B--- Norfolk	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
48B*:						
Orange	Severe: too clayey, wetness.	Severe: wetness, shrink-swell, low strength.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, low strength.	Severe: low strength, shrink-swell.	Moderate: wetness.
Iredell	Severe: too clayey, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.
49B--- Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
50A*:						
Orangeburg	Slight	Slight	Slight	Slight	Slight	Slight.
Faceville	Moderate: too clayey.	Slight	Slight	Slight	Moderate: low strength.	Slight.
50B*:						
Orangeburg	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Faceville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
50C*:						
Orangeburg	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Faceville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
51B2 Pacolet	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
51C2 Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
51D2 Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
52C3 Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: too clayey, slope.
53B*:						
Pacolet	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Moderate: small stones.
Cecil	Moderate: too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Moderate: low strength, shrink-swell.	Moderate: small stones.
53C2*:						
Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: small stones, slope.
Cecil	Moderate: too clayey, slope.	Moderate: slope, shrink-swell, low strength.	Moderate: slope, shrink-swell, low strength.	Severe: slope.	Moderate: low strength, slope, shrink-swell.	Moderate: small stones, slope.
54B Pamunkey	Slight	Moderate: low strength.	Slight	Moderate: slope, low strength.	Moderate: low strength.	Moderate: too sandy.
55A Pamunkey	Slight	Moderate: low strength.	Slight	Moderate: low strength.	Moderate: low strength.	Slight.
55B Pamunkey	Slight	Moderate: low strength.	Slight	Moderate: slope, low strength.	Moderate: low strength.	Slight.
56 Pamunkey	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
57B Pamunkey Variant	Severe: small stones.	Slight	Slight	Slight	Slight	Slight.
58C*:						
Pinkston	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Moderate: slope.
Mayodan	Severe: slope, too clayey.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope, low strength.	Moderate: slope, low strength.	Moderate: slope.
58D*:						
Pinkston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
58D*: Mayodan	Severe: slope, too clayey.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope, low strength.	Severe: slope.
58E*: Pinkston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Mayodan	Severe: slope, too clayey.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
59*, 60*. Pits						
61--- Rains	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, low strength.	Severe: wetness.
62B*: Spotsylvania	Severe: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Severe: low strength.	Slight.
Bourne	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.
62C*: Spotsylvania	Severe: too clayey.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope.	Severe: low strength.	Moderate: slope.
Bourne	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope, wetness.	Moderate: slope, low strength.	Moderate: slope.
63A--- Suffolk	Slight---	Moderate: low strength.	Slight---	Moderate: low strength.	Severe: low strength.	Moderate: too sandy.
63B--- Suffolk	Slight---	Moderate: low strength.	Slight---	Moderate: slope, low strength.	Severe: low strength.	Moderate: too sandy.
63C--- Suffolk	Moderate: slope.	Moderate: slope, low strength.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope, too sandy.
64B--- Tarboro	Severe: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight---	Severe: too sandy.
65B--- Turbeville	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Slight.
66C*, 66D*, 66F*: Udalfs.						
Ochrepts.						
67*. Udifluvents						
68*. Udorthents						
69C*, 69D*. Udults						

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
70B*, 70C*, 70D*, 70E*, 70F*: Udults. Ochrepts.						
71B---------- Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Slight.
71C2---------- Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: slope, low strength.	Severe: low strength.	Moderate: slope.
72B*:						
Varina----------	Slight---------	Slight---------	Moderate: wetness.	Moderate: slope.	Moderate: low strength.	Slight.
Bourne----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength.	Slight.
73---------- Wahee	Severe: wetness, too clayey.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: floods, wetness, low strength.	Severe: low strength, wetness.	Moderate: floods, wetness.
74B2---------- Wedowee	Moderate: too clayey.	Moderate: low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Moderate: low strength, shrink-swell.	Slight.
74C2---------- Wedowee	Moderate: slope.	Moderate: slope, low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: slope.	Moderate: slope, low strength, shrink-swell.	Moderate: slope.
74D2---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
75C3---------- Wedowee	Moderate: slope.	Moderate: slope, low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: slope.	Moderate: slope, low strength, shrink-swell.	Moderate: too clayey, slope.
75D3---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
76D*:						
Wedowee----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ashlar----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
77---------- Wehadkee	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
78---------- Worsham	Severe: wetness, too clayey.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1B Abell	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Fair: too clayey, area reclaim.
2 Altavista	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, seepage.	Severe: wetness, seepage.	Good.
3B Appling	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
3C2 Appling	Moderate: slope, percs slowly.	Severe: slope, seepage.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
4B Appling	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
4C Appling	Moderate: slope, percs slowly.	Severe: slope, seepage.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
5C*: Appling	Moderate: slope, percs slowly.	Severe: slope, seepage.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
Ashlar	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: seepage.	Poor: thin layer.
6*. Aquults					
7 Atlee	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: hard to pack.
8 Augusta	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
9 Bolling Variant	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: small stones.
10B Bourne	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
10C Bourne	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope.
11B*: Bourne	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
Varina	Moderate: percs slowly, wetness.	Moderate: slope.	Slight	Slight	Good.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
11C*:					
Bourne	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope.
Varina	Moderate: slope, percs slowly, wetness.	Severe: slope.	Slight	Moderate: slope.	Fair: slope.
12B	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Caroline					
12D2	Severe: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope, too clayey.
Caroline					
13B2*:					
Caroline	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Dogue	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: too clayey, seepage, wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
13C2*:					
Caroline	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Dogue	Severe: percs slowly, wetness.	Severe: slope, seepage, wetness.	Severe: too clayey, seepage, wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
14B2	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey, seepage.	Slight	Fair: too clayey.
Cecil					
14C2	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey, seepage.	Moderate: slope.	Fair: too clayey, slope.
Cecil					
15B2*:					
Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey, seepage.	Slight	Fair: too clayey.
Vance	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
15C2*:					
Cecil	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey, seepage.	Moderate: slope.	Fair: too clayey, slope.
Vance	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
15D2*:					
Cecil	Severe: slope.	Severe: slope.	Moderate: too clayey, seepage, slope.	Severe: slope.	Poor: slope.
Vance	Severe: percs slowly, slope.	Severe: slope, percs slowly.	Severe: too clayey, slope.	Severe: slope.	Poor: too clayey, slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
16--Chewacla	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
17B--Colfax	Severe: percs slowly, wetness.	Severe: wetness.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: area reclaim, wetness.
17C--Colfax	Severe: slope, percs slowly, wetness.	Severe: slope, wetness.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: area reclaim, wetness.
18--Coxville	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness.
19B--Creedmoor	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
20B--Creedmoor Variant	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey.
21B2--Cullen	Moderate: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, area reclaim.
21C2--Cullen	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, area reclaim.
21D2--Cullen	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope, too clayey, area reclaim.
22--Dawhoo Variant	Severe: wetness, floods.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Poor: wetness, floods.
23--Dogue	Severe: percs slowly, wetness.	Severe: seepage, wetness.	Severe: too clayey, seepage, wetness.	Severe: wetness.	Poor: too clayey, hard to pack.
24--Dunbar	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Fair: too clayey.
25A--Duplin	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Fair: too clayey.
25B--Duplin	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Fair: too clayey.
26B--Edgehill Variant	Moderate: percs slowly.	Severe: small stones.	Slight	Slight	Poor: small stones.
27B--Fluvanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, thin layer.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
27C2---------- Fluvanna	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, thin layer.
28*. Fluvaquents					
29---------- Forestdale	Severe: wetness, percs slowly.	Slight----------	Severe: too clayey, wetness.	Severe: wetness.	Poor: wetness.
30---------- Forestdale	Severe: floods, wetness, percs slowly.	Severe: floods.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: wetness.
31---------- Fork	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Fair: too clayey.
32B---------- Georgeville	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Poor: too clayey.
32C2---------- Georgeville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Poor: too clayey.
33B, 34B---------- Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Good.
35B*: Helena----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
Colfax----------	Severe: percs slowly, wetness.	Severe: wetness.	Severe: depth to rock, wetness.	Severe: wetness.	Poor: area reclaim, wetness.
36C*: Helena----------	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Orange----------	Severe: percs slowly, wetness.	Severe: slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey.
37*. Hydraquents					
38C*: Iredell----------	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: thin layer.
Orange----------	Severe: percs slowly, wetness.	Severe: slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey.
39B---------- Kempsville	Moderate: percs slowly.	Severe: seepage.	Slight----------	Slight----------	Fair: small stones.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
39C---------- Kempsville	Moderate: slope, percs slowly.	Severe: slope, seepage.	Slight----------	Moderate: slope.	Fair: slope, small stones.
40A*:					
Kempsville---------	Moderate: percs slowly.	Severe: seepage.	Slight----------	Slight----------	Good.
Bourne----------	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Good.
40B*:					
Kempsville---------	Moderate: percs slowly.	Severe: seepage.	Slight----------	Slight----------	Good.
Bourne----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
41---------- Kenansville	Slight----------	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
42---------- Kenansville Variant	Severe: wetness, floods.	Severe: wetness, floods, seepage.	Severe: floods, seepage, wetness.	Severe: wetness, floods, seepage.	Fair: too sandy.
43---------- Lenoir	Severe: wetness, percs slowly.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: too clayey.
44B---------- Masada	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: too clayey.	Slight----------	Poor: too clayey.
45B*:					
Mayodan----------	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Creedmoor----------	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
46---------- Myatt Variant	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
47A---------- Norfolk	Moderate: wetness.	Moderate: seepage, wetness.	Moderate: wetness.	Moderate: wetness.	Good.
47B---------- Norfolk	Moderate: wetness.	Moderate: slope, seepage.	Moderate: wetness.	Moderate: wetness.	Good.
48B*:					
Orange----------	Severe: percs slowly, wetness.	Moderate: depth to rock, slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey.
Iredell----------	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey, wetness.	Severe: wetness.	Poor: thin layer.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
49B---------- Orangeburg	Slight----------	Moderate: slope, seepage.	Slight----------	Slight----------	Good.
50A*: Orangeburg---------	Slight----------	Moderate: seepage.	Slight----------	Slight----------	Good.
Faceville---------	Slight----------	Moderate: seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
50B*: Orangeburg---------	Slight----------	Moderate: slope, seepage.	Slight----------	Slight----------	Good.
Faceville---------	Slight----------	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
50C*: Orangeburg---------	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.	Fair: slope.
Faceville---------	Moderate: slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
51B2---------- Pacolet	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
51C2---------- Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
51D2---------- Pacolet	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.	Severe: slope.	Poor: slope.
52C3---------- Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
53B*: Pacolet----------	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Cecil----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey, seepage.	Slight----------	Fair: too clayey.
53C2*: Pacolet----------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
Cecil----------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey, seepage.	Moderate: slope.	Fair: too clayey, slope.
54B, 55A, 55B------- Pamunkey	Slight----------	Severe: seepage.	Severe: seepage.	Slight----------	Fair: too clayey.
56---------- Pamunkey	Severe: floods.	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: too clayey.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
57B---------- Pamunkey Variant	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
58C*: Pinkston----------	Severe: depth to rock.	Severe: slope.	Severe: depth to rock, seepage.	Severe: seepage.	Fair: slope, thin layer, area reclaim.
Mayodan----------	Moderate: slope, percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey.
58D*: Pinkston----------	Severe: slope.	Severe: slope.	Severe: depth to rock, seepage.	Severe: slope.	Poor: slope.
Mayodan----------	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
58E*: Pinkston----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Mayodan----------	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope, too clayey.
59*, 60*. Pits					
61---------- Rains	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Poor: wetness.
62B*: Spotsylvania-------	Moderate: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight----------	Poor: too clayey.
Bourne----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
62C*: Spotsylvania-------	Moderate: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
Bourne----------	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Severe: wetness.	Fair: slope.
63A, 63B---------- Suffolk	Slight----------	Severe: seepage.	Severe: seepage.	Slight----------	Good.
63C---------- Suffolk	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Moderate: slope.	Fair: slope.
64B---------- Tarboro	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
65B---------- Turbeville	Moderate: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight----------	Poor: too clayey.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
66C*, 66D*, 66F*: Udalfs.					
Ochrepts.					
67*. Udifluvents					
68*. Udorthents					
69C*, 69D*. Udults					
70B*, 70C*, 70D*, 70E*, 70F*: Udults.					
Ochrepts.					
71B---------- Vance	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey.
71C2---------- Vance	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
72B*: Varina----------	Moderate: percs slowly, wetness.	Moderate: slope.	Slight----------	Slight----------	Good.
Bourne----------	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Good.
73---------- Wahee	Severe: wetness, percs slowly.	Severe: floods, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, thin layer.
74B2---------- Wedowee	Moderate: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, area reclaim.
74C2---------- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, area reclaim, slope.
74D2---------- Wedowee	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
75C3---------- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, area reclaim, slope.
75D3---------- Wedowee	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
76D*: Wedowee----------	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
Ashlar----------	Severe: slope.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
77---------- Wehadkee	Severe: wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, seepage, wetness.	Poor: wetness.
78---------- Worsham	Severe: percs slowly, wetness.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1B Abell	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
2 Altavista	Poor: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
3B, 3C2, 4B, 4C Appling	Fair: low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
5C*: Appling	Fair: low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
Ashlar	Poor: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Poor: thin layer, area reclaim.
6*. Aquults				
7 Atlee	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
8 Augusta	Fair: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
9 Bolling Variant	Fair: wetness.	Poor: excess fines, small stones.	Poor: excess fines.	Poor: small stones.
10B Bourne	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
10C Bourne	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
11B*: Bourne	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Varina	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
11C*: Bourne	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
Varina	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
12B Caroline	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
12D2 Caroline	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
13B2*: Caroline	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
13B2*:				
Dogue	Poor: low strength, area reclaim.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
13C2*:				
Caroline	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
Dogue	Poor: low strength, area reclaim.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
14B2, 14C2 Cecil	Fair: low strength, shrink-swell.	Poor: excess fines.	Poor: excess fines.	Poor: thin layer.
15B2*, 15C2*:				
Cecil	Fair: low strength, shrink-swell.	Poor: excess fines.	Poor: excess fines.	Poor: thin layer.
Vance	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
15D2*:				
Cecil	Fair: low strength, slope, shrink-swell.	Poor: excess fines.	Poor: excess fines.	Poor: slope, thin layer.
Vance	Poor: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey, slope.
16 Chewacla	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
17B Colfax	Fair: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: area reclaim, thin layer.
17C Colfax	Fair: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, area reclaim, thin layer.
18 Coxville	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
19B Creedmoor	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
20B Creedmoor Variant	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
21B2, 21C2 Cullen	Poor: area reclaim, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim, too clayey.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
21D2---------- Cullen	Poor: area reclaim, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: area reclaim, too clayey, slope.
22---------- Dawhoo Variant	Poor: wetness.	Fair: excess fines.	Poor: excess fines.	Poor: wetness.
23---------- Dogue	Poor: low strength, area reclaim.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
24---------- Dunbar	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
25A, 25B---------- Duplin	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
26B---------- Edgehill Variant	Good----------	Unsuited: excess fines.	Poor: excess fines.	Poor: small stones.
27B---------- Fluvanna	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
27C2---------- Fluvanna	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
28*. Fluvaquents				
29, 30---------- Forestdale	Poor: shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
31---------- Fork	Fair: wetness, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
32B, 32C2---------- Georgeville	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
33B, 34B---------- Goldsboro	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Good.
35B*: Helena----------	Poor: shrink-swell, low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
Colfax----------	Fair: wetness, low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: area reclaim, thin layer.
36C*: Helena----------	Poor: shrink-swell, low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: slope.
Orange----------	Poor: low strength, shrink-swell, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, small stones, thin layer.
37*. Hydraquents				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
38C*:				
Iredell	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Orange	Poor: low strength, shrink-swell, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, small stones, thin layer.
39B, 39C---------- Kempsville	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
40A*, 40B*:				
Kempsville	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Bourne	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
41---------- Kenansville	Good	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
42---------- Kenansville Variant	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
43---------- Lenoir	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
44B---------- Masada	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
45B*:				
Mayodan	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Creedmoor	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
46---------- Myatt Variant	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
47A, 47B---------- Norfolk	Good	Poor: excess fines.	Unsuited: excess fines.	Good.
48B*:				
Orange	Poor: low strength, shrink-swell, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: area reclaim, thin layer, small stones.
Iredell	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
49B---------- Orangeburg	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
50A*, 50B*:				
Orangeburg	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Faceville	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
50C*:				
Orangeburg	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Faceville	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey, slope.
51B2, 51C2 Pacolet	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
51D2 Pacolet	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
52C3 Pacolet	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
53B*, 53C2*:				
Pacolet	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Cecil	Fair: low strength, shrink-swell.	Poor: excess fines.	Poor: excess fines.	Poor: thin layer.
54B Pamunkey	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too sandy.
55A, 55B Pamunkey	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, small stones.
56 Pamunkey	Fair: low strength.	Fair: small stones.	Unsuited: excess fines.	Fair: thin layer, small stones.
57B Pamunkey Variant	Good	Fair: excess fines.	Fair: excess fines.	Poor: small stones.
58C*:				
Pinkston	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
Mayodan	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
58D*:				
Pinkston	Poor: thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
Mayodan	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
58E*:				
Pinkston	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
Mayodan	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
59*, 60*. Pits				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
61--- Rains	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
62B*: Spotsylvania---	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
Bourne---	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
62C*: Spotsylvania---	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
Bourne---	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
63A, 63B, 63C--- Suffolk	Poor: low strength.	Good---	Unsuited: excess fines.	Poor: too sandy.
64B--- Tarboro	Good---	Good---	Unsuited: excess fines.	Fair: too sandy.
65B--- Turbeville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
66C*, 66D*, 66F*: Udalfs.				
Ochrepts.				
67*. Udifluvents				
68*. Udorthents				
69C*, 69D*. Udults				
70B*, 70C*, 70D*, 70E*, 70F*: Udults.				
Ochrepts.				
71B, 71C2--- Vance	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
72B*: Varina---	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Bourne---	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
73--- Wahee	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
74B2 Wedowee	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
74C2 Wedowee	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
74D2 Wedowee	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
75C3 Wedowee	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
75D3 Wedowee	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
76D*:				
Wedowee	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Ashlar	Poor: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Unsuited: thin layer, area reclaim.	Poor: slope.
77 Wehadkee	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
78 Worsham	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
1B---------- Abell	Favorable------	Low strength---	Slow refill----	Favorable------	Favorable------	Favorable.
2---------- Altavista	Seepage--------	Thin layer, wetness.	Deep to water, slow refill.	Favorable------	Not needed-----	Favorable.
3B---------- Appling	Seepage--------	Low strength---	No water-------	Not needed-----	Favorable------	Favorable.
3C2---------- Appling	Seepage--------	Low strength---	No water-------	Not needed-----	Slope----------	Favorable.
4B---------- Appling	Seepage--------	Low strength---	No water-------	Not needed-----	Favorable------	Favorable.
4C---------- Appling	Seepage--------	Low strength---	No water-------	Not needed-----	Slope----------	Favorable.
5C*: Appling----------	Seepage--------	Low strength---	No water-------	Not needed-----	Slope----------	Favorable.
Ashlar----------	Depth to rock, seepage, slope.	Thin layer, seepage.	No water-------	Not needed-----	Depth to rock, rooting depth.	Droughty, rooting depth.
6*. Aquults						
7---------- Atlee	Favorable------	Low strength, piping, unstable fill.	Slow refill----	Percs slowly, wetness.	Erodes easily, percs slowly, wetness.	Wetness, erodes easily, percs slowly.
8---------- Augusta	Seepage--------	Piping---------	Slow refill----	Favorable------	Not needed-----	Wetness.
9---------- Bolling Variant	Seepage--------	Seepage, wetness.	Deep to water	Favorable------	Not needed-----	Not needed.
10B, 10C---------- Bourne	Favorable------	Favorable------	No water-------	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
11B*: Bourne----------	Favorable------	Favorable------	No water-------	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
Varina----------	Favorable------	Favorable------	Deep to water	Not needed-----	Slope----------	Favorable.
11C*: Bourne----------	Favorable------	Favorable------	No water-------	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
Varina----------	Slope----------	Favorable------	Deep to water	Not needed-----	Slope----------	Slope.
12B, 12D2--------- Caroline	Favorable------	Low strength---	No water-------	Not needed-----	Slope, erodes easily.	Percs slowly, erodes easily.
13B2*, 13C2*: Caroline---------	Favorable------	Low strength---	No water-------	Not needed-----	Slope, erodes easily.	Percs slowly, erodes easily.
Dogue----------	Slope, seepage.	Hard to pack, low strength.	Deep to water	Wetness, percs slowly.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
14B2, 14C2--------- Cecil	Seepage----------	Hard to pack----	No water---------	Not needed------	Slope-----------	Slope.
15B2*: Cecil------------	Seepage----------	Hard to pack----	No water---------	Not needed------	Slope-----------	Slope.
Vance------------	Favorable-------	Hard to pack----	No water---------	Not needed------	Percs slowly, erodes easily.	Percs slowly.
15C2*, 15D2*: Cecil------------	Seepage----------	Hard to pack----	No water---------	Not needed------	Slope-----------	Slope.
Vance------------	Favorable-------	Hard to pack----	No water---------	Not needed------	Slope, percs slowly.	Slope, percs slowly.
16--------------- Chewacla	Seepage----------	Hard to pack, piping, wetness.	Slow refill-----	Poor outlets, floods.	Not needed------	Wetness.
17B, 17C---------- Colfax	Favorable-------	Hard to pack, piping, low strength.	Slow refill-----	Percs slowly, wetness.	Percs slowly, wetness, erodes easily.	Percs slowly, wetness, erodes easily.
18--------------- Coxville	Favorable-------	Wetness----------	Slow refill-----	Favorable-------	Not needed------	Wetness.
19B-------------- Creedmoor	Favorable-------	Shrink-swell----	No water---------	Not needed------	Favorable-------	Favorable.
20B-------------- Creedmoor Variant	Favorable-------	Hard to pack, wetness.	Slow refill-----	Percs slowly----	Wetness, percs slowly.	Wetness, percs slowly.
21B2, 21C2, 21D2-- Cullen	Slope-----------	Compressible, low strength.	No water---------	Not needed------	Slope-----------	Slope.
22--------------- Dawhoo Variant	Seepage----------	Seepage, wetness.	Favorable-------	Floods, wetness, poor outlets.	Not needed------	Not needed.
23--------------- Dogue	Slope, seepage.	Hard to pack, low strength.	Deep to water	Wetness, percs slowly.	Erodes easily, percs slowly, wetness.	Erodes easily, percs slowly, wetness.
24--------------- Dunbar	Favorable-------	Compressible----	Slow refill, deep to water.	Percs slowly, wetness.	Not needed------	Not needed.
25A-------------- Duplin	Favorable-------	Hard to pack, wetness.	Slow refill-----	Percs slowly----	Not needed------	Favorable.
25B-------------- Duplin	Favorable-------	Hard to pack, wetness.	Slow refill-----	Slope-----------	Favorable-------	Favorable.
26B-------------- Edgehill Variant	Seepage----------	Seepage----------	No water---------	Not needed------	Small stones----	Slope, droughty.
27B, 27C2--------- Fluvanna	Favorable-------	Compressible, low strength, hard to pack.	No water---------	Not needed------	Slope, erodes easily.	Erodes easily, slope, percs slowly.
28*. Fluvaquents						
29--------------- Forestdale	Favorable-------	Compressible----	Deep to water	Wetness, percs slowly.	Not needed------	Percs slowly, wetness.
30--------------- Forestdale	Favorable-------	Compressible----	Deep to water	Floods, wetness.	Not needed------	Percs slowly, wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
31---------- Fork	Favorable------	Favorable------	Favorable------	Wetness, floods, poor outlets.	Wetness--------	Wetness.
32B---------- Georgeville	Slope, seepage.	Compressible, low strength, erodes easily.	No water-------	Not needed-----	Favorable------	Favorable.
32C2---------- Georgeville	Slope, seepage.	Compressible, low strength, erodes easily.	No water-------	Not needed-----	Complex slope, erodes easily.	Slope, erodes easily.
33B, 34B---------- Goldsboro	Seepage--------	Favorable------	Deep to water	Slope----------	Favorable------	Favorable.
35B*: Helena----------	Depth to rock	Thin layer, hard to pack, wetness.	Slow refill, deep to water.	Percs slowly---	Slope, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Colfax----------	Favorable------	Hard to pack, piping, low strength.	Slow refill----	Percs slowly, wetness.	Percs slowly, wetness, erodes easily.	Percs slowly, wetness, erodes easily.
36C*: Helena----------	Slope----------	Thin layer, hard to pack, wetness.	Slow refill, deep to water.	Slope, percs slowly.	Slope, wetness, percs slowly.	Slope, percs slowly, erodes easily.
Orange----------	Favorable------	Compressible, low strength, shrink-swell.	Depth to rock	Wetness, percs slowly.	Slope, percs slowly, wetness.	Percs slowly, wetness.
37*. Hydraquents						
38C*: Iredell----------	Favorable------	Hard to pack---	Slow refill----	Percs slowly, slope.	Percs slowly, wetness.	Percs slowly, slope.
Orange----------	Favorable------	Compressible, low strength, shrink-swell.	Depth to rock	Wetness, percs slowly.	Slope, percs slowly, wetness.	Percs slowly, wetness.
39B, 39C---------- Kempsville	Seepage--------	Favorable------	No water-------	Not needed-----	Slope----------	Slope.
40A*, 40B*: Kempsville-------	Seepage--------	Favorable------	No water-------	Not needed-----	Slope----------	Slope.
Bourne----------	Favorable------	Favorable------	No water-------	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
41---------- Kenansville	Seepage--------	Seepage--------	Deep to water	Not needed-----	Too sandy------	Droughty.
42---------- Kenansville Variant	Seepage--------	Piping, wetness.	Deep to water, cutbanks cave.	Wetness, floods, cutbanks cave.	Not needed-----	Not needed.
43---------- Lenoir	Favorable------	Compressible---	Slow refill----	Percs slowly---	Not needed-----	Not needed.
44B---------- Masada	Slope----------	Compressible, hard to pack, low strength.	No water-------	Not needed-----	Slope----------	Slope.
45B*: Mayodan----------	Seepage--------	Compressible---	No water-------	Not needed-----	Favorable------	Favorable.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
45B*: Creedmoor	Favorable	Shrink-swell	No water	Not needed	Favorable	Favorable.
46 Myatt Variant	Seepage	Wetness	Slow refill	Floods	Not needed	Not needed.
47A, 47B Norfolk	Seepage	Favorable	No water	Not needed	Slope	Slope.
48B*: Orange	Favorable	Compressible, low strength, shrink-swell.	Depth to rock	Wetness, percs slowly.	Slope, percs slowly, wetness.	Percs slowly, wetness.
Iredell	Favorable	Hard to pack	Slow refill	Percs slowly, slope.	Percs slowly, wetness.	Percs slowly, slope.
49B Orangeburg	Seepage	Favorable	No water	Not needed	Favorable	Favorable.
50A*: Orangeburg	Seepage	Favorable	No water	Not needed	Not needed	Favorable.
Faceville	Seepage	Favorable	No water	Not needed	Favorable	Favorable.
50B*: Orangeburg	Seepage	Favorable	No water	Not needed	Favorable	Favorable.
Faceville	Seepage	Favorable	No water	Not needed	Favorable	Favorable.
50C*: Orangeburg	Seepage	Favorable	No water	Not needed	Slope	Slope.
Faceville	Seepage	Favorable	No water	Not needed	Slope	Slope.
51B2, 51C2, 51D2, 52C3 Pacolet	Seepage	Hard to pack	No water	Not needed	Slope	Slope.
53B*, 53C2*: Pacolet	Seepage	Hard to pack	No water	Not needed	Slope	Slope.
Cecil	Seepage	Hard to pack	No water	Not needed	Slope	Slope.
54B, 55A, 55B, 56- Pamunkey	Seepage	Favorable	No water	Not needed	Favorable	Favorable.
57B Pamunkey Variant	Seepage	Seepage	No water	Not needed	Not needed	Not needed.
58C*, 58D*: Pinkston	Depth to rock, seepage, slope.	Thin layer, seepage.	No water	Not needed	Depth to rock, rooting depth.	Droughty, rooting depth.
Mayodan	Seepage	Compressible	No water	Not needed	Slope	Slope.
58E*: Pinkston	Depth to rock, seepage, slope.	Thin layer, seepage.	No water	Not needed	Depth to rock, rooting depth.	Droughty, rooting depth.
Mayodan	Seepage	Compressible	No water	Not needed	Slope	Slope.
59*, 60*. Pits						
61 Rains	Seepage	Wetness	Slow refill	Favorable	Not needed	Wetness.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
62B*, 62C*: Spotsylvania	Favorable	Compressible, low strength.	No water	Not needed	Slope	Slope.
Bourne	Favorable	Favorable	No water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
63A, 63B, 63C Suffolk	Slope, seepage.	Piping, seepage.	Deep to water	Not needed	Slope, too sandy.	Slope.
64B Tarboro	Seepage	Seepage	No water	Not needed	Too sandy	Droughty.
65B Turbeville	Favorable	Compressible, hard to pack, low strength.	No water	Not needed	Slope	Slope.
66C*, 66D*, 66F*: Udalfs.						
Ochrepts.						
67*. Udifluvents						
68*. Udorthents						
69C*, 69D*. Udults						
70B*, 70C*, 70D*, 70E*, 70F*: Udults.						
Ochrepts.						
71B Vance	Favorable	Hard to pack	No water	Not needed	Percs slowly, erodes easily.	Percs slowly.
71C2 Vance	Favorable	Hard to pack	No water	Not needed	Slope, percs slowly.	Slope, percs slowly.
72B*: Varina	Favorable	Favorable	Deep to water	Not needed	Slope	Favorable.
Bourne	Favorable	Favorable	No water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly, droughty.
73 Wahee	Favorable	Wetness	Slow refill	Floods, percs slowly.	Not needed	Wetness, percs slowly.
74B2, 74C2 Wedowee	Depth to rock, seepage.	Low strength, thin layer.	No water	Not needed	Favorable	Favorable.
74D2 Wedowee	Depth to rock, seepage.	Low strength, thin layer.	No water	Not needed	Slope	Slope.
75C3 Wedowee	Depth to rock, seepage.	Low strength, thin layer.	No water	Not needed	Favorable	Favorable.
75D3 Wedowee	Depth to rock, seepage.	Low strength, thin layer.	No water	Not needed	Slope	Slope.
76D*: Wedowee	Depth to rock, seepage.	Low strength, thin layer.	No water	Not needed	Slope	Slope.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
76D*: Ashlar	Depth to rock, seepage, slope.	Thin layer, seepage.	No water	Not needed	Depth to rock, rooting depth.	Droughty, rooting depth.
77 Wehadkee	Seepage	Wetness	Deep to water, slow refill.	Floods	Not needed	Wetness.
78 Worsham	Favorable	Favorable	Favorable	Percs slowly	Not needed	Percs slowly, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1B---------- Abell	0-15	Fine sandy loam	SM, ML	A-2, A-4	0	90-100	75-100	50-95	25-85	<30	NP-7
	15-27	Sandy clay loam, clay loam, sandy loam.	CL, CL-ML, SM-SC, SC	A-2, A-4, A-6	0	90-100	75-100	50-95	25-85	<40	4-20
	27-39	Clay, clay loam, silty clay loam.	CL, CH	A-6, A-7	0-5	90-100	80-100	70-95	65-90	30-60	15-30
	39-60	Loam, sandy loam	SM, ML	A-2, A-4	0-5	75-100	70-95	60-90	30-75	<30	NP-7
2---------- Altavista	0-18	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	95-100	65-95	35-60	<23	NP-7
	18-41	Clay loam, sandy clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	60-95	50-75	20-45	5-26
	41-90	Variable--------	---	---	0	---	---	---	---	---	---
3B, 3C2---------- Appling	0-8	Fine sandy loam	SM, SM-SC	A-2	0-5	85-100	80-100	55-75	15-35	<27	NP-5
	8-44	Sandy clay, clay loam, clay.	MH, CL, ML, SC	A-7	0-5	95-100	95-100	70-90	50-80	41-74	15-30
	44-60	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6	0-5	95-100	95-100	70-90	40-75	25-45	8-22
4B, 4C---------- Appling	0-8	Gravelly sandy loam.	GM, GP-GM, SM, SP-SM	A-1	5-15	40-70	35-50	25-40	5-15	---	NP
	8-44	Sandy clay, clay loam, clay.	MH, CL, ML, SC	A-7	0-5	95-100	95-100	70-90	51-80	41-74	15-30
	44-60	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6	0-5	95-100	95-100	70-90	40-75	25-45	8-22
5C*:											
Appling----------	0-8	Fine sandy loam	SM, SM-SC	A-2	0-5	85-100	80-100	55-75	15-35	<27	NP-5
	8-44	Sandy clay, clay loam, clay.	MH, CL, ML, SC	A-7	0-5	95-100	95-100	70-92	51-80	41-74	15-30
	44-60	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6	0-5	95-100	95-100	70-90	40-75	25-45	8-22
Ashlar----------	0-11	Sandy loam------	SC, SM	A-2, A-4, A-1	0-2	70-95	65-95	40-80	20-50	12-21	NP-4
	11-30	Sandy loam, fine sandy loam, gravelly sandy loam.	SC, SM, GM, GC	A-1, A-2, A-4	2-8	55-95	50-90	30-75	15-50	14-23	NP-6
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
6*. Aquults											

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7---------- Atlee	0-9	Loam----------	ML, CL, SM	A-4	0	95-100	95-100	60-100	35-90	10-25	2-10
	9-27	Silt loam, loam, clay loam.	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	60-85	24-40	6-16
	27-52	Clay loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	85-100	60-90	24-50	6-22
	52-89	Clay loam, silty clay loam, clay.	CL, ML, MH	A-6, A-7	0	95-100	95-100	90-100	70-95	32-60	12-28
8---------- Augusta	0-7	Fine sandy loam	SM, SM-SC	A-2, A-4	0	90-100	75-100	50-80	30-50	<25	NP-7
	7-33	Sandy clay loam, clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	75-100	75-95	50-80	20-45	5-25
	33-76	Coarse sandy loam, loam, gravelly loamy sand.	SM, SP-SM, ML	A-2, A-4, A-1	0	75-100	55-100	30-90	10-70	<25	NP-5
9---------- Bolling Variant	0-11	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-75	50-70	30-50	15-30	12-25	NP-4
	11-35	Very gravelly sandy loam, very gravelly sandy clay loam, gravelly sandy loam.	GP-GM, GP-GC, SM, GC	A-1, A-2	0-5	35-60	25-50	15-45	7-30	15-35	NP-12
	35-64	Sand, very gravelly sand, gravelly sandy clay loam.	SM, GP, SP, GC	A-1, A-2	0-5	30-95	10-90	5-60	0-30	12-30	NP-12
10B, 10C---------- Bourne	0-13	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	80-100	70-100	45-85	20-55	<25	NP-6
	13-24	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6, A-7	0	80-100	70-100	60-95	30-80	30-50	10-25
	24-68	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC	A-2, A-4, A-6	0	80-100	70-100	50-95	30-80	20-40	5-20
	68-76	Variable---------	---	---	---	---	---	---	---	---	---
10B*, 11C*: Bourne----------	0-13	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	80-100	70-100	45-85	20-55	<25	NP-6
	13-24	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6, A-7	0	80-100	70-100	60-95	30-80	30-50	10-25
	24-68	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC	A-2, A-4, A-6	0	80-100	70-100	50-95	30-80	20-40	5-20
	68-76	Variable---------	---	---	---	---	---	---	---	---	---
Varina----------	0-7	Gravelly sandy loam.	SW-SM, SM-SC, SM, SP-SM	A-1, A-2	0-5	70-90	55-75	30-55	10-35	<25	NP-7
	7-32	Clay loam, gravelly clay loam, clay.	SC, CL	A-4, A-6, A-7	0-5	85-100	70-100	60-95	40-70	28-47	8-20
	32-65	Sandy clay, clay loam, clay.	CL, SC	A-4, A-6, A-7	0-5	85-100	75-100	70-95	36-70	28-47	8-20

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
12B, 12D2---------- Caroline	0-8	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-85	30-55	<25	NP-5
	8-78	Clay loam, clay, silty clay.	CL, CH	A-7	0	90-100	85-100	80-100	60-90	41-70	18-40
13B2*, 13C2*: Caroline----------	0-8	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-85	30-55	<25	NP-5
	8-78	Clay loam, clay, silty clay.	CL, CH	A-7	0	90-100	85-100	80-100	60-90	41-70	18-40
Dogue----------	0-11	Loam----------	ML, CL, SM, SC	A-4	0	95-100	75-100	60-95	40-85	<30	NP-10
	11-51	Clay loam, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	95-100	75-100	65-95	40-90	35-60	16-32
	51-99	Stratified sand to sandy clay loam.	SM, SC, SP-SM, SM-SC	A-2, A-4, A-1	0	80-100	60-100	35-70	10-40	<26	NP-8
14B2, 14C2---------- Cecil	0-9	Fine sandy loam	SM, SM-SC	A-2, A-4	0	85-100	80-100	65-90	25-40	<30	NP-6
	9-53	Clay----------	MH, ML	A-7, A-5	0	95-100	92-100	70-100	55-95	41-80	9-37
	53-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
15B2*, 15C2*, 15D2*: Cecil----------	0-9	Gravelly sandy loam.	GM, GM-GC, SM, SM-SC	A-2, A-1	0	40-75	35-70	25-60	15-30	<22	NP-4
	9-53	Clay----------	MH, ML	A-7, A-5	0	95-100	90-100	70-99	55-95	41-80	9-37
	53-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Vance----------	0-12	Gravelly sandy loam.	SM, GM, GP-GM	A-1	5-15	40-70	35-50	25-40	5-15	---	NP
	12-48	Clay loam, sandy clay, clay.	CH, MH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	48-68	Weathered bedrock.	---	---	---	---	---	---	---	---	---
16---------- Chewacla	0-9	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	95-100	60-90	30-50	<35	NP-7
	9-60	Sandy clay loam, loam, sandy loam.	SM, CL-ML, SM-SC, ML	A-4	0	95-100	95-100	60-80	35-70	<35	NP-7
17B, 17C---------- Colfax	0-12	Sandy loam------	ML, SM, CL-ML, SM-SC	A-4	0	95-100	90-100	60-90	40-80	<25	NP-7
	12-24	Sandy clay loam, clay loam, loam.	SC, CL	A-4, A-6	0	90-100	85-100	75-90	40-80	25-40	7-15
	24-60	Sandy loam, fine sandy loam, clay loam.	ML, CL, SM, SC	A-2, A-4	0	95-100	90-100	60-90	30-70	<30	NP-10
18---------- Coxville	0-12	Loam----------	SM, ML, CL-ML	A-4, A-6, A-7	0	100	100	85-100	45-75	20-46	3-15
	12-82	Clay loam, sandy clay, clay.	CL, CH	A-6, A-7	0	100	100	85-100	55-80	30-55	12-35

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
19B---------- Creedmoor	0-11	Fine sandy loam	SM	A-4, A-2	0	100	100	70-85	30-45	---	NP
	11-21	Sandy clay loam	MH, CH	A-7	0	100	100	85-95	70-80	60-70	30-40
	21-58	Clay, silty clay	MH, CH	A-7	0	100	100	94-97	75-88	61-79	32-49
	58-88	Weathered bedrock.	---	---	---	---	---	---	---	---	---
20B---------- Creedmoor Variant	0-10	Fine sandy loam	ML, SM	A-4	0	95-100	95-100	70-85	40-55	12-20	NP-4
	10-55	Clay, clay loam, sandy clay loam.	CH	A-7	0	95-100	95-100	75-95	55-90	60-80	30-45
	55-92	Variable--------	---	---	---	---	---	---	---	---	---
21B2, 21C2, 21D2--- Cullen	0-8	Loam----------	ML, CL, CL-ML	A-6, A-7	0	90-100	85-100	75-95	50-75	30-44	10-20
	8-58	Clay----------	CH	A-7	0	90-100	85-100	75-100	65-95	55-65	30-40
	58-99	Clay loam, clay, loam.	CH, ML	A-7, A-4	0	90-100	85-100	75-100	50-85	50-65	30-40
22---------- Dawhoo Variant	0-11	Fine sandy loam	SM, SM-SC	A-2, A-4	0	70-95	70-90	50-80	25-50	12-25	NP-7
	11-50	Gravelly loamy sand.	SM, SP-SM, GP-GM	A-2, A-1, A-3	0	50-80	40-75	25-55	10-20	10-15	NP
	50-63	Variable--------	---	---	---	---	---	---	---	---	---
23---------- Dogue	0-11	Loam----------	ML, CL, SM, SC	A-4	0	95-100	75-100	60-95	40-85	<30	NP-10
	11-51	Clay loam, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	95-100	75-100	65-95	40-90	35-60	16-32
	51-99	Stratified sand to sandy clay loam.	SM, SC, SP-SM, SM-SC	A-2, A-4, A-1	0	80-100	60-100	35-70	10-40	<26	NP-8
24---------- Dunbar	0-10	Fine sandy loam	SM, SM-SC	A-2, A-4	0	100	100	50-95	20-50	<20	NP-7
	10-65	Sandy clay, clay loam, clay.	CL, CH	A-6, A-7	0	100	100	85-95	50-70	36-60	18-35
25A, 25B---------- Duplin	0-9	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	100	100	65-100	25-60	<16	NP-7
	9-72	Sandy clay, clay loam, clay.	CL, CH	A-6, A-7	0	100	98-100	80-100	50-80	24-54	13-39
26B---------- Edgehill Variant	0-18	Very gravelly sandy loam.	GM, GW-GM	A-1, A-2	0-5	30-50	20-40	15-25	10-15	20-30	NP-7
	18-64	Very gravelly sandy clay loam.	GM, GP-GM	A-1, A-2	0-5	30-50	20-40	15-35	5-25	30-40	7-14
27B, 27C2---------- Fluvanna	0-9	Silt loam-------	SM, SC, ML, CL	A-2, A-4, A-6	0	85-100	80-100	55-100	30-90	16-40	NP-16
	9-59	Clay, silty clay, silty clay loam.	MH	A-7	0	95-100	95-100	85-100	70-95	60-95	25-50
	59-70	Clay loam, silty clay loam, gravelly clay loam.	CL, GC, SC	A-6, A-7, A-2	0-5	50-100	45-100	40-100	30-95	32-46	14-22
28*. Fluvaquents											

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
29, 30---------- Forestdale	0-8	Loam----------	ML, CL	A-4, A-6	0	100	100	95-100	80-95	10-30	5-15
	8-46	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0	100	100	95-100	90-100	40-65	20-40
	46-60	Silty clay loam, silt loam, fine sandy loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	75-100	20-50	5-30
31---------- Fork	0-18	Fine sandy loam	ML, SM, CL, SC	A-4	0	95-100	95-100	70-95	40-80	<30	NP-10
	18-42	Clay loam, sandy clay loam, loam.	SC, CL, ML, SM	A-4, A-6, A-7	0	95-100	95-100	80-100	35-80	32-46	8-20
	42-64	Variable--------	---	---	---	---	---	---	---	---	---
32B, 32C2---------- Georgeville	0-10	Loam----------	ML, CL-ML	A-4	0-3	90-100	85-100	65-100	50-100	<40	NP-10
	10-40	Silty clay, silty clay loam, clay loam.	MH, ML	A-7-5	0	95-100	95-100	90-100	75-100	41-75	15-35
	40-56	Silty clay loam, silt loam, clay loam.	MH	A-7-5	0	95-100	90-100	65-100	60-100	50-75	15-35
	56-93	Silt loam--------	ML, CL, CL-ML	A-4	0-5	90-100	90-100	65-100	60-95	<30	NP-10
33B, 34B---------- Goldsboro	0-10	Fine sandy loam	SM, SM-SC, SC	A-2, A-4	0	90-100	85-100	50-95	15-45	<25	NP-14
	10-90	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	25-55	16-35	4-16
35B*: Helena----------	0-6	Sandy loam------	SM, SM-SC, SC	A-2, A-4	0	95-100	90-100	50-85	25-45	<30	NP-9
	6-12	Sandy clay loam, clay loam.	CL	A-6, A-7	0	95-100	95-100	70-90	55-70	30-49	15-25
	12-47	Clay loam, sandy clay, clay.	CH, MH	A-7	0	95-100	95-100	75-95	55-80	50-85	24-50
	47-60	Variable--------	---	---	---	---	---	---	---	---	---
Colfax----------	0-12	Sandy loam------	ML, SM, CL-ML, SM-SC	A-4	0	95-100	90-100	60-90	40-80	<25	NP-7
	12-24	Sandy clay loam, clay loam, loam.	SC, CL	A-4, A-6	0	90-100	85-100	75-90	40-80	25-40	7-15
	24-60	Sandy loam, fine sandy loam, clay loam.	ML, CL, SM, SC	A-2, A-4	0	95-100	90-100	60-90	30-70	<30	NP-10
36C*: Helena----------	0-6	Sandy loam------	SM, SM-SC, SC	A-2, A-4	0	95-100	90-100	50-85	25-45	<30	NP-9
	6-12	Sandy clay loam, clay loam.	CL	A-6, A-7	0	95-100	95-100	70-90	55-70	30-49	15-25
	12-47	Clay loam, sandy clay, clay.	CH, MH	A-7	0	95-100	95-100	75-95	55-80	50-85	24-50
	47-60	Variable--------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
36C*:											
Orange	0-10	Fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4	0	90-95	85-95	75-95	45-85	<24	NP-6
	10-42	Clay, silty clay, silty clay loam.	CH	A-7	0	90-95	85-95	75-95	65-90	70-99	45-70
	42-60	Variable	---	---	0-10	70-100	60-100	50-100	40-90	---	---
37*. Hydraquents											
38C*:											
Iredell	0-9	Sandy loam	SM	A-2-4, A-4	0-1	90-100	80-90	65-80	30-50	<35	NP-9
	9-29	Clay	CH	A-7	0	100	85-100	80-100	65-95	60-115	30-85
	29-34	Loam, sandy clay loam, clay loam.	CL, CH, SC	A-7	0-1	100	85-100	70-95	40-75	41-60	20-39
	34-90	Variable	---	---	---	---	---	---	---	---	---
Orange	0-10	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	90-95	85-95	75-95	45-85	<24	NP-6
	10-42	Clay, silty clay, clay loam.	CH	A-7	0	90-95	85-95	75-95	65-90	70-99	45-70
	42-60	Variable	---	---	0-10	70-100	60-100	50-100	40-90	---	---
39B, 39C Kempsville	0-12	Gravelly sandy loam.	SM, SM-SC	A-1, A-2	0-5	55-80	50-75	30-60	5-35	<20	NP-7
	12-45	Sandy clay loam, sandy loam, gravelly sandy clay loam.	CL, CL-ML, SC, SM-SC	A-1, A-2, A-4, A-6	0-5	55-100	50-100	35-90	20-70	20-40	5-20
	45-60	Stratified fine sandy loam to gravelly sandy clay loam.	CL, SC, SM, GM	A-1, A-2, A-4	0	55-100	50-100	10-85	5-55	<40	NP-15
40A*, 40B*:											
Kempsville	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-2, A-4	0-5	80-100	75-100	45-90	25-65	<20	NP-7
	12-45	Sandy clay loam, sandy loam, gravelly sandy clay loam.	CL, CL-ML, SC, SM-SC	A-1, A-2, A-4, A-6	0-5	55-100	50-100	35-90	20-70	20-40	5-20
	45-60	Stratified fine sandy loam to gravelly sandy clay loam.	CL, SC, SM, GM	A-1, A-2, A-4	0	55-100	50-100	10-85	5-55	<40	NP-15
Bourne	0-13	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	80-100	70-100	45-85	20-55	<25	NP-6
	13-24	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6, A-7	0	80-100	70-100	60-95	30-80	30-50	10-25
	24-68	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC	A-2, A-4, A-6	0	80-100	70-100	50-95	30-80	20-40	5-20
	68-76	Variable	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
41---------- Kenansville	0-21	Loamy sand------	SM	A-1, A-2	0	100	95-100	45-60	10-25	<25	NP-3
	21-48	Sandy loam, fine sandy loam, sandy clay loam	SM, SC, SM-SC	A-2	0	100	95-100	50-65	20-35	<30	NP-10
	48-99	Sand, loamy sand	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-60	5-30	---	NP
42---------- Kenansville Variant	0-27	Loamy sand------	SM	A-2	0	95-100	95-100	50-75	15-30	10-20	NP
	27-34	Fine sandy loam	ML, CL-ML, SM	A-2, A-4	0	95-100	95-100	70-85	30-55	15-30	NP-7
	34-76	Loamy sand, sand	SM, SP-SM	A-2, A-3	0	95-100	95-100	45-75	5-30	10-20	NP
43---------- Lenoir	0-9	Loam----------	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	20-35	1-10
	9-99	Clay, silty clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
44B---------- Masada	0-8	Fine sandy loam	ML, SM, SC	A-2, A-4	0-20	75-100	70-100	55-85	30-70	<30	NP-8
	8-53	Clay loam, clay, gravelly clay.	MH, GC, CH, CL	A-2, A-7	0-20	55-100	50-100	40-95	20-95	45-65	16-35
	53-67	Clay loam, gravelly clay loam, cobbly clay loam.	MH, GC, SC, CL	A-2, A-4, A-6, A-7	0-40	55-100	50-100	30-85	15-70	30-45	6-20
45B*: Mayodan----------	0-8	Sandy loam------	SM, ML, SM-SC	A-2, A-4	0-5	90-100	90-100	50-75	30-65	<36	NP-5
	8-47	Clay, clay loam, sandy clay.	MH, CH	A-7	0-2	95-100	95-100	95-100	50-90	60-80	28-40
	47-89	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Creedmoor---------	0-11	Fine sandy loam	SM	A-4, A-2	0	100	100	70-85	30-45	---	NP
	11-21	Sandy clay loam	MH, CH	A-7	0	100	100	85-95	70-80	60-70	30-40
	21-58	Clay, silty clay	MH, CH	A-7	0	100	100	94-97	75-88	61-79	32-49
	58-88	Weathered bedrock.	---	---	---	---	---	---	---	---	---
46---------- Myatt Variant	0-10	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	80-100	75-100	55-85	30-55	10-25	NP-5
	10-45	Sandy clay loam, clay loam, silty clay loam.	CL, CH, SC	A-2, A-6, A-7	0-5	80-100	75-100	60-95	25-70	35-55	15-30
	45-60	Fine sandy loam, sand, gravelly sand.	SM, ML, GP-GM, SP-SM	A-1, A-2, A-4	0-5	55-100	45-100	20-80	5-55	10-25	NP-5
47A---------- Norfolk	0-20	Fine sandy loam	SM, SM-SC, SC	A-2	0	95-100	95-100	50-90	15-35	<25	NP-14
	20-80	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	90-100	70-95	30-55	20-38	4-15

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
47B---------- Norfolk	0-20	Fine sandy loam	SM, SM-SC, SC	A-2	0	95-100	95-100	50-90	15-35	<25	NP-14
	20-80	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	90-100	70-95	30-55	20-38	4-15
48B*:											
Orange----------	0-10	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4	0	90-95	85-95	75-95	45-85	<24	NP-6
	10-42	Clay, silty clay, clay loam.	CH	A-7	0	90-95	85-95	75-95	65-90	70-99	45-70
	42-60	Variable--------	---	---	0-10	70-100	60-100	50-100	40-90	---	---
Iredell----------	0-9	Sandy loam------	SM	A-2-4, A-4	0-1	90-98	80-90	65-80	30-50	<35	NP-9
	9-29	Clay----------	CH	A-7	0	100	85-100	80-100	65-95	60-115	30-85
	29-34	Loam, sandy clay loam, clay loam.	CL, CH, SC	A-7	0-1	100	85-100	70-95	40-75	41-60	20-39
	34-90	Variable--------	---	---	---	---	---	---	---	---	---
49B---------- Orangeburg	0-16	Fine sandy loam	SM	A-2	0	100	95-100	75-95	20-35	---	NP
	16-70	Sandy clay loam	SC, CL	A-6, A-4	0	100	95-100	70-90	38-55	22-40	8-19
50A*, 50B*, 50C*:											
Orangeburg--------	0-16	Fine sandy loam	SM	A-2	0	100	95-100	75-95	20-35	---	NP
	16-70	Sandy clay loam	SC, CL	A-6, A-4	0	100	95-100	70-90	35-55	22-40	8-19
Faceville---------	0-10	Fine sandy loam	SM, SM-SC	A-2, A-4	0	90-100	85-100	70-95	15-40	<25	NP-5
	10-70	Sandy clay, clay, clay loam.	CL, SC	A-6, A-7	0	100	95-100	75-100	45-70	25-43	11-23
51B2---------- Pacolet	0-5	Fine sandy loam	SM, SM-SC	A-2	0-2	85-100	80-100	60-80	20-35	<36	NP-10
	5-35	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	50-75	38-65	11-30
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
51C2, 51D2--------- Pacolet	0-5	Fine sandy loam	SM, SM-SC	A-2	0-2	85-100	80-100	60-80	20-35	<36	NP-10
	5-35	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	50-75	38-65	11-30
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
52C3---------- Pacolet	0-5	Clay loam-------	SM-SC, SC	A-4, A-6	0-1	95-100	90-100	65-85	36-50	20-40	4-17
	5-35	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	50-75	38-65	11-30
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
53B*, 53C2*:											
Pacolet----------	0-8	Gravelly sandy loam.	SM	A-2	0-3	75-90	70-85	55-75	15-30	<30	NP-4
	8-35	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	50-75	38-65	11-30
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
53B*, 53C2*:											
Cecil	0-8	Gravelly sandy loam.	GM, GM-GC, SM, SM-SC	A-2, A-1	0	40-75	35-70	25-60	15-30	<22	NP-4
	8-53	Clay	MH, ML	A-7, A-5	0	95-100	90-100	70-100	55-95	41-80	9-37
	53-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
54B	0-9	Loamy sand	SM, ML, SP-SM, SM-SC	A-2, A-4	0	80-100	75-100	50-85	10-55	<20	NP-7
Pamunkey	9-46	Sandy clay loam, clay loam, loam.	CL, SC	A-2, A-6	0-5	80-100	75-100	70-95	30-75	30-40	10-20
	46-99	Stratified sandy loam to sand.	SW, SM, SW-SM, SM-SC	A-1, A-2, A-3	0-10	60-100	50-95	25-70	5-35	<20	NP-6
55A, 55B, 56	0-9	Fine sandy loam	SM, ML, SP-SM, SM-SC	A-2, A-4	0	80-100	75-100	50-85	12-55	<20	NP-7
Pamunkey	9-46	Sandy clay loam, clay loam, loam.	CL, SC	A-2, A-6	0-5	80-100	75-100	70-95	30-75	30-40	10-20
	46-99	Stratified sandy loam to sand.	SW, SM, SW-SM, SM-SC	A-1, A-2, A-3	0-10	60-100	50-95	25-70	5-35	<20	NP-6
57B	0-9	Gravelly sandy loam.	GM, SM	A-1, A-2	0-5	60-75	50-70	30-50	15-30	<25	NP-4
Pamunkey Variant	9-26	Gravelly sandy loam, very gravelly sandy loam.	SM, GM, SP-SM	A-1, A-2, A-3	0-5	35-60	25-50	15-35	10-20	<25	NP-4
	26-60	Loamy sand, gravelly sand, gravelly loamy sand.	GP, SP, SM, GM	A-1, A-2, A3	0-5	45-60	35-50	15-40	5-15	---	NP
58C*, 58D*, 58E*:											
Pinkston	0-12	Sandy loam	CL, ML, SM, SC	A-2, A-4	0-5	80-100	75-100	45-95	25-75	<30	NP-10
	12-32	Loam, clay loam, sandy loam.	SC, CL	A-2, A-4, A-6	0-10	70-100	50-100	35-95	20-75	20-40	9-26
	32-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Mayodan	0-8	Sandy loam	SM, ML, SM-SC	A-2, A-4	0-5	90-100	90-100	50-75	30-65	<36	NP-5
	8-47	Clay, clay loam, sandy clay.	MH, CH	A-7	0-2	95-100	95-100	95-100	50-90	60-80	28-40
	47-89	Weathered bedrock.	---	---	---	---	---	---	---	---	---
59*, 60*. Pits											
61	0-17	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-55	<35	NP-10
Rains	17-68	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	100	65-100	35-70	18-45	4-22
	68-80	Sandy loam, sandy clay loam, sandy clay.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	95-100	60-95	30-60	15-40	3-18

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
62B*, 62C*: Spotsylvania	0-12	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	85-95	80-95	55-90	30-65	<30	NP-7
		clay loam.	SM, SC	A-4, A-6, A-7							
	25-60	Clay, clay loam	CH, MH, CL, ML	A-7	0-5	80-95	75-95	70-90	60-90	41-60	16-30
Bourne	0-13	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	80-100	70-100	45-85	20-55	<25	NP-6
	13-24	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6, A-7	0	80-100	70-100	60-95	30-80	30-50	10-25
	24-68	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC	A-2, A-4, A-6	0	80-100	70-100	50-95	30-80	20-40	5-20
	68-76	Variable	---	---	---	---	---	---	---	---	---
63A, 63B, 63C Suffolk	0-9	Loamy fine sand	SM	A-1, A-2, A-4	0	90-100	75-100	40-85	15-40	<20	NP
	9-36	Sandy clay loam, clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	90-100	75-100	50-95	25-75	20-40	5-20
	36-72	Loamy fine sand, fine sandy loam, gravelly sand.	SP, SM, SM-SC	A-1, A-2, A-4	0	75-100	60-100	30-80	5-50	<25	NP-7
64B Tarboro	0-12	Loamy sand	SM, SP-SM, SW-SM	A-2, A-3	0	100	90-100	65-99	5-25	---	NP
	12-94	Sand, loamy sand gravelly loamy sand.	SP, SM GP, GM	A-1, A-2	0	70-100	60-100	30-75	5-25	---	NP
65B Turbeville	0-10	Fine sandy loam	ML, SM, CL-ML	A-2, A-4	0-30	75-100	70-100	50-90	30-75	<28	NP-7
	10-88	Clay, clay loam, sandy clay.	CL, MH, CH	A-7	0-20	70-100	65-100	60-100	55-95	45-65	16-35
66C*, 66D*, 66F*: Udalfs.											
Ochrepts.											
67*. Udifluvents											
68*. Udorthents											
69C*, 69D*. Udults											
70B*, 70C*, 70D*, 70E*, 70F*: Udults.											
Ochrepts.											

See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
71B, 71C2---------- Vance	0-12	Fine sandy loam	SM, SM-SC	A-2, A-4	0-5	90-100	80-100	55-80	15-40	<27	NP-5
	12-48	Clay loam, sandy clay, clay.	CH, MH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	48-68	Weathered bedrock.	---	---	---	---	---	---	---	---	---
72B*:											
Varina----------	0-7	Gravelly sandy loam.	SW-SM, SM-SC, SM, SP-SM	A-1, A-2	0-5	70-90	55-75	30-55	10-35	<25	NP-7
	7-32	Clay loam, gravelly clay loam, clay.	SC, CL	A-4, A-6, A-7	0-5	85-100	70-100	60-95	40-70	28-47	8-20
	32-65	Sandy clay, clay loam, clay.	CL, SC	A-4, A-6, A-7	0-5	85-100	75-100	70-95	35-70	28-47	8-20
Bourne----------	0-13	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-2, A-4	0	80-100	70-100	45-85	20-55	<25	NP-6
	13-24	Sandy clay loam, clay loam, loam.	SC, CL	A-2, A-6, A-7	0	80-100	70-100	60-95	30-80	30-50	10-25
	24-68	Loam, sandy clay loam, fine sandy loam.	SC, CL, SM-SC	A-2, A-4, A-6	0	80-100	70-100	50-95	30-80	20-40	5-20
	68-76	Variable--------	---	---	---	---	---	---	---	---	---
73---------- Wahee	0-8	Loam----------	ML, CL-ML, CL	A-4	0	100	100	90-98	50-75	20-35	2-10
	8-44	Clay, clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	70-90	41-60	18-32
	44-65	Variable--------	---	---	---	---	---	---	---	---	---
74B2, 74C2, 74D2--- Wedowee	0-5	Fine sandy loam	SM, SM-SC	A-4	0	95-100	90-100	60-85	30-50	<30	NP-6
	5-33	Sandy clay, clay loam, clay.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	65-100	45-70	30-58	10-25
	33-60	Variable--------	---	---	---	---	---	---	---	---	---
75C3, 75D3---------- Wedowee	0-5	Clay loam--------	SC, CL	A-4, A-6	0	90-100	90-100	80-95	45-75	<32	7-15
	5-33	Sandy clay, clay loam, clay.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	65-100	45-70	30-58	10-25
	33-60	Variable--------	---	---	---	---	---	---	---	---	---
76D*:											
Wedowee----------	0-5	Fine sandy loam	SM, SM-SC	A-4	0	95-100	90-100	60-85	30-50	<30	NP-6
	5-33	Sandy clay, clay loam, clay.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	65-95	45-70	30-58	10-25
	33-60	Variable--------	---	---	---	---	---	---	---	---	---
Ashlar----------	0-11	Sandy loam------	SC, SM	A-2, A-4, A-1	0-2	70-95	65-95	40-80	20-50	12-21	NP-4
	11-30	Sandy loam, fine sandy loam, gravelly sandy loam.	SC, SM, GM, GC	A-1, A-2, A-4	2-8	55-95	50-90	30-75	15-50	14-23	NP-6
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

* See footnote at end of table.

TABLE 13.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
77---------- Wehadkee	0-8	Loam, clay loam	CL, MH, ML, CH	A-6, A-7	0	100	100	85-100	50-95	25-52	11-22
	8-92	Loam, sandy clay loam, clay loam.	ML, CL	A-6, A-7	0	100	100	90-100	50-85	30-45	11-20
78---------- Worsham	0-11	Fine sandy loam	SM, SC, ML, CL	A-2, A-4	0-5	90-100	85-100	50-85	25-55	16-30	NP-9
	11-60	Sandy clay loam, sandy clay, clay.	SC, MH, CH	A-2, A-7	0-5	90-100	85-100	70-100	30-95	42-66	22-40

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
1B---------- Abell	0-15 15-27 27-39 39-60	0.6-6.0 0.6-2.0 0.6-2.0 0.6-6.0	0.08-0.20 0.13-0.19 0.11-0.17 0.08-0.18	4.5-6.5 4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Low---------- Moderate------- Low----------	0.28 0.28 0.43 0.24	4
2---------- Altavista	0-18 18-41 41-90	2.0-6.0 0.6-2.0 ---	0.12-0.20 0.12-0.20 ---	4.5-6.0 4.5-6.0 ---	Low---------- Low---------- ----------	0.20 0.24 ----	4
3B, 3C2---------- Appling	0-8 8-44 44-60	2.0-6.0 0.6-2.0 0.6-2.0	0.10-0.15 0.15-0.17 0.12-0.16	4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Moderate------- Low----------	0.24 0.20 0.24	4
4B, 4C---------- Appling	0-8 8-44 44-60	2.0-6.0 0.6-2.0 0.6-2.0	0.08-0.13 0.15-0.17 0.12-0.16	4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Moderate------- Low----------	0.20 0.20 0.24	4
5C*: Appling--------- 8-44 44-60	0-8 0.6-2.0 0.6-2.0	2.0-6.0 0.15-0.17 0.12-0.16	4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Moderate------- Low----------	0.24 0.20 0.24	4
Ashlar---------- 11-30 30	0-11 2.0-6.0 ---	2.0-6.0 0.04-0.14 ---	0.08-0.15 4.5-5.5 ---	4.5-6.0 Low---------- Low---------- ----------	0.24 0.43 ----	2
6*. Aquults							
7---------- Atlee	0-9 9-27 27-52 52-89	0.6-2.0 0.6-2.0 0.2-0.6 0.2-2.0	0.14-0.20 0.14-0.20 0.07-0.12 0.11-0.19	4.5-6.0 4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Low---------- Low---------- Moderate-------	0.37 0.37 0.37 0.37	3
8---------- Augusta	0-7 7-33 33-76	2.0-6.0 0.6-2.0 2.0-6.0	0.10-0.15 0.12-0.18 0.06-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low---------- Low---------- Low----------	0.15 0.24 0.24	4
9---------- Bolling Variant	0-11 11-35 35-64	2.0-6.0 2.0-6.0 >2.0	0.07-0.10 0.04-0.10 0.01-0.10	5.1-6.5 5.1-6.5 5.1-6.5	Low---------- Low---------- Low----------	0.20 0.20 0.17	4
10B, 10C--------- Bourne	0-13 13-24 24-68 68-76	2.0-6.0 0.6-2.0 <0.2 ---	0.08-0.15 0.11-0.16 0.08-0.12 ---	4.5-6.5 3.6-5.5 3.6-5.5 ---	Low---------- Low---------- Low---------- ----------	0.43 0.43 0.43 ----	3
11B*, 11C*: Bourne---------- 13-24 24-68 68-76	0-13 2.0-6.0 0.6-2.0 <0.2 ---	0.08-0.15 0.11-0.16 0.08-0.12 ---	4.5-6.5 3.6-5.5 3.6-5.5 ---	Low---------- Low---------- Low---------- ----------	0.43 0.43 0.43 ----	3
Varina---------- 7-32 32-65	0-7 2.0-6.0 0.6-2.0 0.6-2.0	0.05-0.11 0.12-0.18 0.10-0.17	4.5-6.5 4.5-5.5 4.5-5.5	Low---------- Low---------- Low----------	0.17 0.28 0.28	4
12B, 12D2-------- Caroline	0-8 8-78	0.6-6.0 0.06-0.6	0.08-0.15 0.14-0.22	4.5-6.0 4.5-5.5	Low---------- Moderate-------	0.43 0.43	3

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
13B2*, 13C2*:							
Caroline	0-8	0.6-6.0	0.08-0.15	4.5-6.0	Low	0.43	3
	8-78	0.06-0.6	0.14-0.22	4.5-5.5	Moderate	0.43	
Dogue	0-11	0.6-2.0	0.14-0.20	3.6-6.5	Low	0.32	4
	11-51	0.2-0.6	0.12-0.19	3.6-5.5	Moderate	0.28	
	51-99	0.6-6.0	0.05-0.14	3.6-5.5	Low	0.17	
14B2, 14C2	0-9	2.0-6.0	0.12-0.14	4.5-6.0	Low	0.28	3
Cecil	9-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate	0.28	
	53-60	---	---	---	---	----	
15B2*, 15C2*, 15D2*:							
Cecil	0-9	6.0-20	0.07-0.09	4.5-6.0	Low	0.24	4
	9-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate	0.28	
	53-60	---	---	---	---	----	
Vance	0-12	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.24	2
	12-48	0.06-0.2	0.12-0.15	4.5-5.5	Moderate	0.37	
	48-68	---	---	---	---	----	
16	0-9	0.6-2.0	0.10-0.15	4.5-6.5	Low	0.24	4
Chewacla	9-60	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.28	
17B, 17C	0-12	0.6-6.0	0.10-0.18	4.5-5.5	Low	0.37	4
Colfax	12-24	0.6-2.0	0.13-0.18	4.5-5.5	Moderate	0.37	
	24-60	0.06-0.2	0.06-0.10	4.5-5.5	Low	0.43	
18	0-12	0.6-2.0	0.12-0.17	4.5-6.0	Low	0.28	---
Coxville	12-82	0.2-0.6	0.14-0.18	4.5-5.5	Moderate	0.32	
19B	0-11	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.37	3
Creedmoor	11-21	0.2-0.6	0.13-0.15	3.6-5.5	Moderate	0.32	
	21-58	<0.06	0.13-0.15	3.6-5.5	High	0.32	
	58-88	---	---	---	---	----	
20B	0-10	2.0-6.0	0.10-0.15	4.5-6.5	Low	0.37	3
Creedmoor Variant	10-55	<0.06	0.10-0.16	4.5-5.5	High	0.32	
	55-92	---	---	---	---	----	
21B2, 21C2, 21D2-	0-8	2.0-6.0	0.14-0.19	5.1-6.0	Low	0.37	4
Cullen	8-58	0.6-2.0	0.10-0.14	5.1-6.0	Moderate	0.37	
	58-99	0.6-2.0	0.14-0.19	5.1-6.0	Moderate	0.37	
22	0-11	2.0-6.0	0.10-0.15	5.6-7.3	Low	0.17	4
Dawhoo Variant	11-50	6.0-20	0.04-0.08	5.6-7.3	Low	0.17	
	50-63	---	---	---	---	----	
23	0-11	0.6-2.0	0.14-0.20	3.6-6.5	Low	0.32	4
Dogue	11-51	0.2-0.6	0.12-0.19	3.6-5.5	Moderate	0.28	
	51-99	0.6-6.0	0.05-0.14	3.6-5.5	Low	0.17	
24	0-10	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.32	---
Dunbar	10-65	0.2-0.6	0.13-0.18	4.5-5.5	Moderate	0.32	
25A, 25B	0-9	2.0-6.0	0.10-0.15	5.1-7.3	Low	0.32	3
Duplin	9-72	0.2-0.6	0.13-0.18	4.5-5.5	Moderate	0.28	
26B	0-18	0.6-6.0	0.03-0.07	4.5-6.0	Low	0.24	4
Edgehill Variant	18-64	0.6-2.0	0.04-0.08	4.5-5.5	Low	0.24	
27B, 27C2	0-9	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.32	3
Fluvanna	9-59	0.06-0.6	0.10-0.17	4.5-5.5	Moderate	0.43	
	59-70	0.06-0.6	0.05-0.09	4.5-5.5	Moderate	0.28	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
28*. Fluvaquents							
29, 30---------- Forestdale	0-8	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.43	3
	8-46	<.06	0.14-0.18	4.5-6.0	High----------	0.28	
	46-60	0.2-0.6	0.17-0.22	4.5-6.0	Moderate-------	0.28	
31---------- Fork	0-18	2.0-6.0	0.14-0.21	4.5-6.0	Low----------	0.43	2
	18-42	0.6-2.0	0.16-0.21	4.5-7.3	Moderate-------	0.43	
	42-64	---	---	---	----------	----	
32B, 32C2--------- Georgeville	0-10	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.43	3
	10-40	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.37	
	40-56	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.43	
	56-93	0.6-2.0	0.05-0.10	4.5-5.5	Low----------	0.43	
33B, 34B--------- Goldsboro	0-10	2.0-6.0	0.08-0.12	4.5-6.0	Low----------	0.20	5
	10-90	0.6-2.0	0.11-0.15	4.5-5.5	Low----------	0.24	
35B*:							
Helena----------	0-6	2.0-6.0	0.10-0.12	4.5-6.0	Low----------	0.37	3
	6-12	0.2-0.6	0.13-0.15	4.5-5.5	Moderate-------	0.37	
	12-47	0.06-0.2	0.13-0.15	4.5-5.5	High----------	0.32	
	47-60	---	---	---	----------	----	
Colfax----------	0-12	0.6-6.0	0.10-0.18	4.5-5.5	Low----------	0.37	4
	12-24	0.6-2.0	0.13-0.18	4.5-5.5	Moderate-------	0.37	
	24-60	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.43	
36C*:							
Helena----------	0-6	2.0-6.0	0.10-0.12	4.5-6.0	Low----------	0.37	3
	6-12	0.2-0.6	0.13-0.15	4.5-5.5	Moderate-------	0.37	
	12-47	0.06-0.2	0.13-0.15	4.5-5.5	High----------	0.32	
	47-60	---	---	---	----------	----	
Orange----------	0-10	0.6-2.0	0.14-0.20	5.1-6.5	Low----------	0.49	2
	10-42	0.06-0.2	0.10-0.19	5.1-6.5	High----------	0.28	
	42-60	0.2-0.6	0.13-0.20	5.6-7.8	Low----------	0.43	
37*. Hydraquents							
38C*:							
Iredell----------	0-9	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.32	3
	9-29	0.06-0.2	0.16-0.22	6.1-7.3	Very high------	0.20	
	29-34	0.06-0.6	0.14-0.18	6.1-7.8	High----------	0.28	
	34-90	---	---	---	----------	----	
Orange----------	0-10	0.6-2.0	0.14-0.20	5.1-6.5	Low----------	0.49	2
	10-42	0.06-0.2	0.10-0.19	5.1-6.5	High----------	0.28	
	42-60	0.2-0.6	0.13-0.20	5.6-7.8	Low----------	0.43	
39B, 39C--------- Kempsville	0-12	2.0-6.0	0.04-0.08	4.5-6.5	Low----------	0.24	4
	12-45	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.43	
	45-60	<0.06	0.05-0.16	4.5-5.5	Low----------	0.17	
40A*, 40B*:							
Kempsville------	0-12	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.28	4
	12-45	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.43	
	45-60	<0.06	0.05-0.16	4.5-5.5	Low----------	0.17	
Bourne----------	0-13	2.0-6.0	0.08-0.15	4.5-6.5	Low----------	0.43	3
	13-24	0.6-2.0	0.11-0.16	3.6-5.5	Low----------	0.43	
	24-68	<0.2	0.08-0.12	3.6-5.5	Low----------	0.43	
	68-76	---	---	---	----------	----	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
41----------	0-21	6.0-20	0.04-0.10	4.5-6.0	Low----------	0.15	5
Kenansville	21-48	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.15	
	48-99	6.0-20	<0.05	4.5-6.0	Low----------	0.10	
42----------	0-27	6.0-20	0.05-0.07	4.5-6.5	Low----------	0.15	5
Kenansville Variant	27-34	2.0-6.0	0.10-0.15	4.5-5.5	Low----------	0.15	
	34-76	6.0-20	0.04-0.08	4.5-5.5	Low----------	0.15	
43----------	0-9	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.37	---
Lenoir	9-99	0.06-0.2	0.13-0.15	4.5-5.5	Moderate-------	0.32	
44B----------	0-8	2.0-6.0	0.10-0.17	4.5-5.5	Low----------	0.32	4
Masada	8-53	0.6-2.0	0.10-0.17	4.5-5.5	Moderate-------	0.28	
	53-67	0.6-2.0	0.10-0.17	4.5-5.5	Moderate-------	0.28	
45B*:							
Mayodan----------	0-8	>6.0	0.11-0.17	4.5-6.0	Low----------	0.24	3
	8-47	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.24	
	47-89	---	0.02-0.06	4.5-5.5	Low----------	----	
Creedmoor-------	0-11	2.0-6.0	0.10-0.14	3.6-5.5	Low----------	0.37	3
	11-21	0.2-0.6	0.13-0.15	3.6-5.5	Moderate-------	0.32	
	21-58	<0.06	0.13-0.15	3.6-5.5	High----------	0.32	
	58-88	---	---	---	----------	----	
46----------	0-10	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	----	---
Myatt Variant	10-45	0.6-2.0	0.13-0.19	3.6-5.5	Low----------	----	
	45-60	>2.0	0.02-0.10	3.6-5.5	Low----------	----	
47A----------	0-20	2.0-6.0	0.06-0.10	4.5-6.0	Low----------	0.17	5
Norfolk	20-80	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24	
47B----------	0-20	2.0-6.0	0.06-0.10	4.5-6.0	Low----------	0.17	5
Norfolk	20-80	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24	
48B*:							
Orange----------	0-10	0.6-2.0	0.14-0.20	5.1-6.5	Low----------	0.49	2
	10-42	0.06-0.2	0.10-0.19	5.1-6.5	High----------	0.28	
	42-60	0.2-0.6	0.13-0.20	5.6-7.8	Low----------	0.43	
Iredell---------	0-9	2.0-6.0	0.12-0.15	5.6-7.3	Low----------	0.32	3
	9-29	0.06-0.2	0.16-0.22	6.1-7.3	Very high------	0.20	
	29-34	0.06-0.6	0.14-0.18	6.1-7.8	High----------	0.28	
	34-90	---	---	---	----------	----	
49B----------	0-16	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.24	5
Orangeburg	16-70	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.24	
50A*, 50B*, 50C*:							
Orangeburg------	0-16	2.0-6.0	0.07-0.10	4.5-6.0	Low----------	0.24	5
	16-70	0.6-2.0	0.10-0.13	4.5-5.5	Low----------	0.24	
Faceville-------	0-10	6.0-20	0.06-0.09	4.5-5.5	Low----------	0.28	5
	10-70	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37	
51B2----------	0-5	2.0-6.0	0.08-0.12	4.5-6.0	Low----------	0.20	3
Pacolet	5-35	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28	
	35-60	---	---	---	----------	----	
51C2, 51D2-------	0-5	2.0-6.0	0.08-0.12	4.5-6.0	Low----------	0.20	3
Pacolet	5-35	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28	
	35-60	---	---	---	----------	----	
52C3----------	0-5	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.24	2
Pacolet	5-35	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28	
	35-60	---	---	---	----------	----	

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
53B*, 53C2*:							
Pacolet	0-8	2.0-6.0	0.06-0.10	4.5-6.0	Low	0.28	3
	8-35	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.28	
	35-60	---	---	---	---	---	
Cecil	0-8	6.0-20	0.07-0.09	4.5-6.0	Low	0.24	4
	8-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate	0.28	
	53-60	---	---	---	---	---	
54B, 55A, 55B, 56	0-9	2.0-20	0.06-0.15	5.1-7.3	Low	0.28	4
Pamunkey	9-46	0.6-2.0	0.13-0.19	5.1-7.3	Low	0.28	
	46-99	2.0-20	0.04-0.12	5.1-6.0	Low	0.28	
57B	0-9	2.0-6.0	0.06-0.08	5.1-7.3	Low	0.20	4
Pamunkey Variant	9-26	2.0-6.0	0.04-0.08	5.1-6.5	Low	0.20	
	26-60	>6.0	0.02-0.08	5.1-6.5	Low	0.17	
58C*, 58D*, 58E*:							
Pinkston	0-12	0.6-6.0	0.08-0.18	4.5-6.5	Low	0.43	2
	12-32	2.0-6.0	0.06-0.18	4.5-5.5	Low	0.43	
	32-72	---	---	---	---	---	
Mayodan	0-8	>6.0	0.11-0.17	4.5-6.0	Low	0.24	3
	8-47	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.24	
	47-89	---	0.02-0.06	4.5-5.5	Low	---	
59*, 60*. Pits							
61	0-17	2.0-6.0	0.08-0.12	4.5-6.5	Low	0.17	5
Rains	17-68	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	
	68-80	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	
62B*, 62C*:							
Spotsylvania	0-12	0.6-6.0	0.08-0.20	4.5-6.0	Low	0.32	4
	12-25	0.6-2.0	0.13-0.19	4.5-5.5	Low	0.32	
	25-60	0.6-2.0	0.12-0.19	4.5-5.5	Low	0.32	
Bourne	0-13	2.0-6.0	0.08-0.15	4.5-6.5	Low	0.43	3
	13-24	0.6-2.0	0.11-0.16	3.6-5.5	Low	0.43	
	24-68	<0.2	0.08-0.12	3.6-5.5	Low	0.43	
	68-76	---	---	---	---	---	
63A, 63B, 63C	0-9	2.0-20	0.06-0.10	5.1-7.3	Low	0.24	4
Suffolk	9-36	0.6-2.0	0.12-0.20	4.5-5.5	Low	0.28	
	36-72	>2.0	0.04-0.10	4.5-5.5	Low	0.17	
64B	0-12	6.0-20	0.05-0.09	5.1-6.5	Low	0.10	5
Tarboro	12-94	>20	0.02-0.06	5.1-6.5	Low	0.10	
65B	0-10	2.0-6.0	0.10-0.17	4.5-5.5	Low	0.32	3
Turbeville	10-88	0.6-2.0	0.13-0.16	4.5-5.5	Moderate	0.28	
66C*, 66D*, 66F*:							
Udalfs.							
Ochrepts.							
67*. Udifluvents							
68*. Udorthents							
69C*, 69D*. Udults							

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
70B*, 70C*, 70D*, 70E*, 70F*: Udults.							
Ochrepts.							
71B, 71C2--------- Vance	0-12 12-48 48-68	2.0-6.0 0.06-0.2 ---	0.10-0.14 0.12-0.15 ---	4.5-6.0 4.5-5.5 ---	Low---------- Moderate-------- ----------	0.28 0.37 ----	3
72B*: Varina---------- Bourne----------	0-7 7-32 32-65 0-13 13-24 24-68 68-76	2.0-6.0 0.6-2.0 0.6-2.0 2.0-6.0 0.6-2.0 <0.2 ---	0.05-0.11 0.12-0.18 0.10-0.17 0.08-0.15 0.11-0.16 0.08-0.12 ---	4.5-6.5 4.5-5.5 4.5-5.5 4.5-6.5 3.6-5.5 3.6-5.5 ---	Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- ----------	0.17 0.28 0.28 0.43 0.43 0.43 ----	4 3
73---------- Wahee	0-8 8-44 44-65	0.2-2.0 0.06-0.2 0.2-0.6	0.15-0.20 0.12-0.20 0.12-0.20	4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Moderate-------- Moderate--------	0.28 0.28 0.28	5
74B2, 74C2, 74D2- Wedowee	0-5 5-33 33-60	2.0-6.0 0.2-0.6 ---	0.10-0.18 0.12-0.18 ---	4.5-5.5 4.5-5.5 ---	Low---------- Moderate-------- ----------	0.24 0.28 ----	2
75C3, 75D3------- Wedowee	0-5 5-33 33-60	0.6-2.0 0.2-0.6 ---	0.12-0.18 0.12-0.18 ---	4.5-5.5 4.5-5.5 ---	Low---------- Moderate-------- ----------	0.28 0.28 ----	2
76D*: Wedowee--------- Ashlar----------	0-5 5-33 33-60 0-11 11-30 30	2.0-6.0 0.2-0.6 --- 2.0-6.0 2.0-6.0 ---	0.10-0.18 0.12-0.18 --- 0.08-0.15 0.04-0.14 ---	4.5-5.5 4.5-5.5 --- 4.5-6.0 4.5-5.5 ---	Low---------- Moderate-------- ---------- Low---------- Low---------- ----------	0.24 0.28 ---- 0.24 0.43 ----	2 2
77---------- Wehadkee	0-8 8-92	2.0-6.0 0.6-2.0	0.14-0.18 0.16-0.20	4.5-6.5 4.5-6.5	Low---------- Low----------	0.24 0.32	---
78---------- Worsham	0-11 11-60	2.0-6.0 0.06-0.6	0.08-0.15 0.10-0.16	4.5-5.5 4.5-5.5	Low---------- Moderate--------	0.43 0.43	2

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1B---------- Abell	B	None--------	---	---	2.0-3.5	Apparent	Dec-Mar	>60	---	Moderate	High.
2---------- Altavista	C	Occasional	Very brief	Mar-Jul	1.5-2.5	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
3B, 3C2, 4B, 4C--- Appling	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
5C*:											
Appling----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Ashlar----------	B	None--------	---	---	4.0-6.0	Apparent	---	22-40	Hard	Low-------	High.
6*. Aquults											
7---------- Atlee	C	None--------	---	---	1.5-2.5	Apparent	Nov-Mar	>60	---	High------	High.
8---------- Augusta	C	None to common.	Brief-----	Jan-May	1.0-2.0	Apparent	Jan-May	>60	---	High------	Moderate.
9---------- Bolling Variant	C	None--------	---	---	2.0-3.0	Apparent	Nov-Apr	>60	---	Low-------	High.
10B, 10C---------- Bourne	C	None--------	---	---	1.5-2.5	Perched	Dec-May	>60	---	High------	High.
11B*, 11C*:											
Bourne----------	C	None--------	---	---	1.5-2.5	Perched	Dec-May	>60	---	High------	High.
Varina----------	C	None--------	---	---	2.5-5.0	Perched	Dec-Apr	>60	---	Moderate	High.
12B, 12D2--------- Caroline	C	None--------	---	---	>6.0	---	---	>60	---	High------	High.
13B2*, 13C2*:											
Caroline---------	C	None--------	---	---	>6.0	---	---	>60	---	High------	High.
Dogue----------	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	High------	High.
14B2, 14C2-------- Cecil	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
15B2*, 15C2*, 15D2*:											
Cecil----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Vance----------	C	None--------	---	---	>6.0	---	---	>60	---	High------	High.
16---------- Chewacla	C	Frequent----	Brief-----	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High------	Moderate.
17B, 17C---------- Colfax	C	None--------	---	---	1.0-1.5	Perched	Nov-Jun	>48	Rippable	High------	High.
18---------- Coxville	D	None to rare	---	---	0-2.5	Apparent	Nov-Apr	>60	---	High------	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
19B---------- Creedmoor	C	None---------	---	---	1.0-2.0	Perched	Jan-Mar	>60	---	High-----	High.
20B---------- Creedmoor Variant	C	None---------	---	---	0.5-1.5	Apparent	Nov-Apr	>60	---	High-----	High.
21B2, 21C2, 21D2-- Cullen	C	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
22---------- Dawhoo Variant	D	Frequent----	Brief-----	Oct-Jun	0-1.0	Apparent	Oct-Jun	>60	---	High-----	Moderate.
23---------- Dogue	C	None---------	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	High-----	High.
24---------- Dunbar	D	None---------	---	---	1.0-2.5	Apparent	Nov-May	>60	---	High-----	High.
25A, 25B---------- Duplin	C	None---------	---	---	2.0-3.5	Apparent	Dec-Apr	>60	---	High-----	High.
26B---------- Edgehill Variant	B	None---------	---	---	>6.0	---	---	>60	---	Low------	High.
27B, 27C2--------- Fluvanna	C	None---------	---	---	4.0-6.0	Apparent	Dec-May	>60	---	High-----	High.
28*. Fluvaquents											
29---------- Forestdale	D	None---------	---	---	0.5	Apparent	Jan-Mar	>60	---	High-----	Moderate.
30---------- Forestdale	D	Frequent----	Long------	Jan-Mar	0.5	Apparent	Jan-Mar	>60	---	High-----	Moderate.
31---------- Fork	C	Occasional	Very brief	Oct-May	1.0-2.0	Apparent	Dec-Mar	>60	---	High-----	High.
32B, 32C2--------- Georgeville	B	None---------	---	---	>6.0	---	---	>60	---	High-----	High.
33B, 34B---------- Goldsboro	B	None---------	---	---	2.5-3.5	Apparent	Dec-Mar	>60	---	Moderate	High.
35B*:											
Helena----------	C	None---------	---	---	1.0-2.5	Perched	Jan-Mar	48-60	Rippable	High-----	High.
Colfax----------	C	None---------	---	---	1.0-1.5	Perched	Nov-Jun	>48	Rippable	High-----	High.
36C*:											
Helena----------	C	None---------	---	---	1.0-2.5	Perched	Jan-Mar	48-60	Rippable	High-----	High.
Orange----------	D	None---------	---	---	1.0-3.0	Apparent	Dec-May	40-60	Hard	High-----	Moderate.
37*. Hydraquents											
38C*:											
Iredell----------	D	None---------	---	---	1.0-2.0	Perched	Nov-Mar	>60	---	High-----	Low.
Orange----------	D	None---------	---	---	1.0-3.0	Apparent	Dec-May	40-60	Hard	High-----	Moderate.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
39B, 39C---------- Kempsville	B	None--------	---	---	4.5-6.0	Apparent	Dec-Apr	>60	---	Low------	Moderate.
40A*, 40B*: Kempsville-------	B	None--------	---	---	4.5-6.0	Apparent	Dec-Apr	>60	---	Low------	Moderate.
Bourne----------	C	None--------	---	---	1.5-2.5	Perched	Dec-May	>60	---	High-----	High.
41---------- Kenansville	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
42---------- Kenansville Variant	B	Occasional	Very brief	Nov-May	2.0-3.0	Apparent	Nov-May	>60	---	Low------	High.
43---------- Lenoir	D	None--------	---	---	1.0-2.5	Apparent	Dec-May	>60	---	High-----	High.
44B---------- Masada	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
45B*: Mayodan----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
Creedmoor--------	C	None--------	---	---	1.0-2.0	Perched	Jan-Mar	>60	---	High-----	High.
46---------- Myatt Variant	D	Frequent----	Brief-----	Nov-May	0-1.0	Apparent	Nov-May	>60	---	High-----	High.
47A, 47B---------- Norfolk	B	None--------	---	---	4.0-6.0	Apparent	Jan-Mar	>60	---	Moderate	High.
48B*: Orange----------	D	None--------	---	---	1.0-3.0	Apparent	Dec-May	40-60	Hard	High-----	Moderate.
Iredell----------	D	None--------	---	---	1.0-2.0	Perched	Nov-Mar	>60	---	High-----	Low.
49B---------- Orangeburg	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
50A*, 50B*, 50C*: Orangeburg-------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Faceville--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
51B2, 51C2, 51D2, 52C3---------- Pacolet	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
53B*, 53C2*: Pacolet----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Cecil----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
54B, 55A, 55B----- Pamunkey	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
56---------- Pamunkey	B	Occasional	Brief-----	Jan-Jun	>6.0	---	---	>60	---	Moderate	Moderate.
57B---------- Pamunkey Variant	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
58C*, 58D*, 58E*: Pinkston----------	B	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	High.
Mayodan----------	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
59*, 60*. Pits											
61---------- Rains	B/D	Rare--------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High-----	High.
62B*, 62C*:											
Spotsylvania-----	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Bourne----------	C	None--------	---	---	1.5-2.5	Perched	Dec-May	>60	---	High-----	High.
63A, 63B, 63C----- Suffolk	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
64B---------- Tarboro	A	None to rare	---	---	>6.0	---	---	>60	---	Low------	Moderate.
65B---------- Turbeville	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
66C*, 66D*, 66F*: Udalfs.											
Ochrepts.											
67*. Udifluvents											
68*. Udorthents											
69C*, 69D*. Udults											
70B*, 70C*, 70D*, 70E*, 70F*: Udults.											
Ochrepts.											
71B, 71C2--------- Vance	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
72B*:											
Varina----------	C	None--------	---	---	2.5-5.0	Perched	Dec-Apr	>60	---	Moderate	High.
Bourne----------	C	None--------	---	---	1.5-2.5	Perched	Dec-May	>60	---	High-----	High.
73---------- Wahee	D	Occasional	Brief-----	Dec-Apr	0.5-1.5	Apparent	Dec-Mar	>60	---	High-----	High.
74B2, 74C2, 74D2, 75C3, 75D3------- Wedowee	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
76D*:											
Wedowee----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
Ashlar----------	B	None--------	---	---	4.0-6.0	Apparent	---	22-40	Hard	Low------	High.
77---------- Wehadkee	D	Common------	Brief-----	Nov-Jun	0-2.5	Apparent	Nov-Jun	>60	---	High-----	Moderate.
78---------- Worsham	D	None--------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High-----	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Abell	Fine-loamy, mixed, thermic Aquic Hapludults
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Appling	Clayey, kaolinitic, thermic Typic Hapludults
Ashlar	Coarse-loamy, mixed, thermic Typic Dystrochrepts
Atlee	Fine-loamy, siliceous, thermic Fragiaquic Paleudults
Augusta	Fine-loamy, mixed, thermic Aeric Ochraquults
Bolling Variant	Loamy-skeletal, mixed, thermic Mollic Hapludalfs
Bourne	Fine-loamy, mixed, thermic Typic Fragiudults
*Caroline	Clayey, mixed, thermic Typic Paleudults
Cecil	Clayey, kaolinitic, thermic Typic Hapludults
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Colfax	Fine-loamy, mixed, thermic Aquic Fragiudults
Coxville	Clayey, kaolinitic, thermic Typic Paleaquults
Creedmoor	Clayey, mixed, thermic Aquic Hapludults
Creedmoor Variant	Clayey, mixed, thermic Aeric Ochraquults
*Cullen	Clayey, mixed, thermic Typic Hapludults
Dawhoo Variant	Sandy, siliceous, thermic Typic Humaquepts
Dogue	Clayey, mixed, thermic Aquic Hapludults
Dunbar	Clayey, kaolinitic, thermic Aeric Paleaquults
Duplin	Clayey, kaolinitic, thermic Aquic Paleudults
Edgehill Variant	Loamy-skeletal, mixed, thermic Typic Hapludults
Faceville	Clayey, kaolinitic, thermic Typic Paleudults
Fluvanna	Clayey, mixed, thermic Typic Hapludults
*Forestdale	Fine, montmorillonitic, thermic Typic Ochraqualfs
Fork	Fine-loamy, mixed, thermic Aeric Ochraqualfs
Georgeville	Clayey, kaolinitic, thermic Typic Hapludults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Helena	Clayey, mixed, thermic Aquic Hapludults
Iredell	Fine, montmorillonitic, thermic Typic Hapludalfs
Kempsville	Fine-loamy, siliceous, thermic Typic Hapludults
Kenansville	Loamy, siliceous, thermic Arenic Hapludults
Kenansville Variant	Loamy, siliceous, thermic Arenic Hapludults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Masada	Clayey, mixed, thermic Typic Hapludults
Mayodan	Clayey, kaolinitic, thermic Typic Hapludults
Myatt Variant	Fine-loamy, mixed, thermic Typic Ochraquults
Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults
Orange	Fine, montmorillonitic, thermic Albaquic Hapludalfs
Orangeburg	Fine-loamy, siliceous, thermic Typic Paleudults
Pacolet	Clayey, kaolinitic, thermic Typic Hapludults
Pamunkey	Fine-loamy, mixed, thermic Ultic Hapludalfs
Pamunkey Variant	Loamy-skeletal, mixed, thermic Ultic Hapludalfs
Pinkston	Coarse-loamy, mixed, thermic Ruptic-Ultic Dystrochrepts
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Spotsylvania	Clayey, kaolinitic, thermic Typic Hapludults
Suffolk	Fine-loamy, siliceous, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Turbeville	Clayey, mixed, thermic Typic Paleudults
Vance	Clayey, mixed, thermic Typic Hapludults
*Varina	Clayey, kaolinitic, thermic Plinthic Paleudults
Wahee	Clayey, mixed, thermic Aeric Ochraquults
Wedowee	Clayey, kaolinitic, thermic Typic Hapludults
*Wehadkee	Fine-loamy, mixed, nonacid, thermic Typic Fluvaquents
Worsham	Clayey, mixed, thermic Typic Ochraquults

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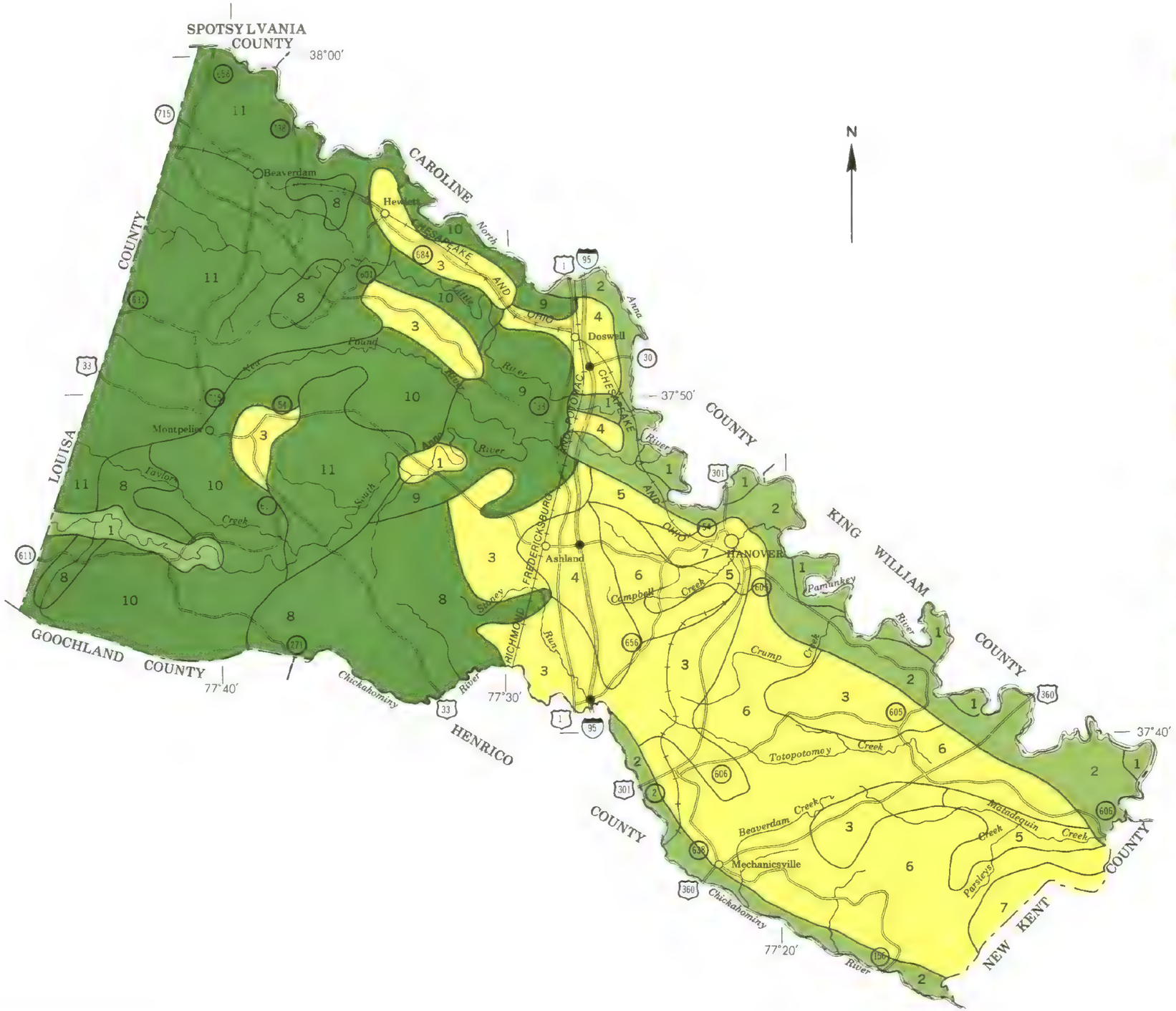


SOIL ASSOCIATIONS

SOILS MAINLY OF THE FLOOD PLAINS AND TERRACES

1 Fluvaquents-Chewacla-Altavista association: Deep, poorly drained, somewhat poorly drained, and moderately well drained soils that are frequently flooded and that have a mixed sandy, loamy, and clayey substratum, or that have a loamy subsoil; along drainageways and streams

2 Pamunkey-Dogue-Forestdale association: Deep, well drained, moderately well drained, and poorly drained soils that have a dominantly loamy or clayey subsoil; on terraces and uplands

SOILS OF THE COASTAL PLAIN

3 Norfolk-Orangeburg-Faceville association: Deep, well drained soils that have a dominantly loamy or clayey subsoil; on uplands

4 Duplin-Coxville-Dunbar association: Deep, moderately well drained, somewhat poorly drained, and poorly drained soils that have a dominantly clayey subsoil; on upland flats

5 Ochrepts-Udults-Kempsville association: Deep, well drained, somewhat excessively drained, excessively drained, and moderately well drained soils that have a dominantly sandy, loamy, or clayey subsoil, or a subsoil with some brittleness; on uplands

6 Udults-Ochrepts-Suffolk association: Deep, well drained, somewhat excessively drained, excessively drained, and moderately well drained soils that have a dominantly sandy, loamy, or clayey subsoil; on uplands

7 Norfolk-Caroline-Dogue association: Deep, well drained, and moderately well drained soils that have a dominantly loamy or clayey subsoil; on uplands

SOILS OF THE PIEDMONT PLATEAU

8 Vance-Orange-Colfax association: Deep, well drained, moderately well drained, and somewhat poorly drained soils that have a dominantly very firm clayey subsoil or that have a fragipan; on uplands and upland flats

9 Creedmoor-Udalfs-Mayodan association: Moderately deep and deep, moderately well drained, well drained, somewhat excessively drained, and excessively drained soils that have a dominantly clayey or loamy subsoil; on uplands

10 Cecil-Pacolet-Cullen association: Deep, well drained soils that have a dominantly clayey subsoil; on uplands

11 Wedowee-Pacolet-Appling association: Deep, well drained soils that have a dominantly clayey and loamy subsoil; on uplands

Compiled 1979

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

GENERAL SOIL MAP
HANOVER COUNTY, VIRGINIA

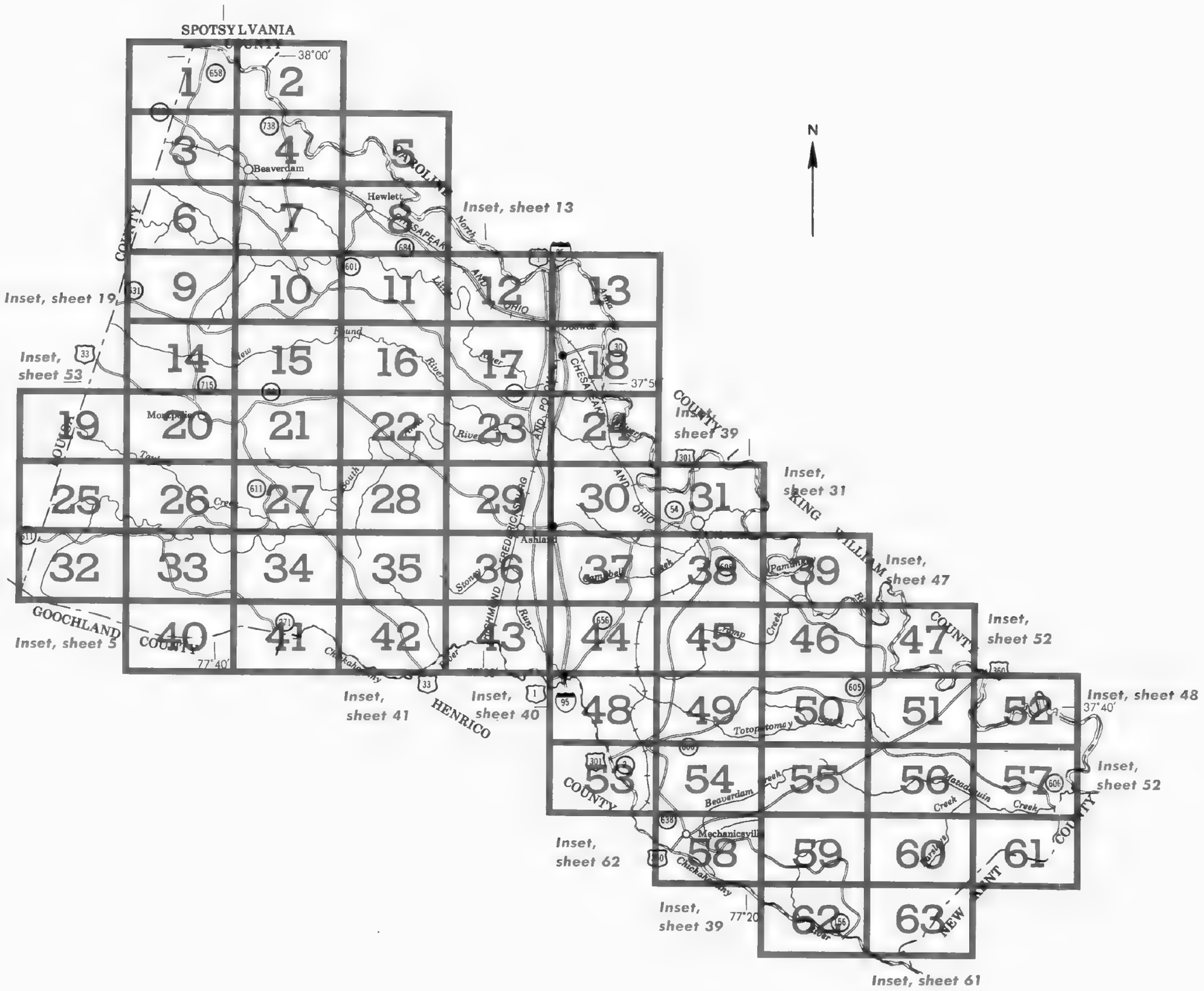
Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of the specific tracts.

1–13364



INDEX TO MAP SHEETS
HANOVER COUNTY, VIRGINIA

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

Compiled 1979

1-13364

SOIL LEGEND

Symbols consist of numbers or a combination of numbers and a letter. The capital letter shows the slope. Most symbols without a slope letter are those of nearly level soils or they are for miscellaneous areas that have a considerable range of slope. A final number, 2 or 3, shows that the soil is eroded or severely eroded.

SYMBOL	NAME
1B	Abell fine sandy loam, 2 to 7 percent slopes
2	Altavista fine sandy loam
3B	Appling fine sandy loam, 2 to 7 percent slopes
3C2	Appling fine sandy loam, 7 to 15 percent slopes, eroded
4B	Appling gravelly sandy loam, 2 to 7 percent slopes
4C	Appling gravelly sandy loam, 7 to 15 percent slopes
5C	Appling-Ashlar complex, 5 to 15 percent slopes
6	Aquults, nearly level*
7	Atlee loam, 0 to 4 percent slopes
8	Augusta fine sandy loam
9	Bolling Variant gravelly sandy loam
10B	Bourne fine sandy loam, 2 to 7 percent slopes
10C	Bourne fine sandy loam, 7 to 15 percent slopes
11B	Bourne-Varina complex, 2 to 7 percent slopes
11C	Bourne-Varina complex, 7 to 15 percent slopes
12B	Caroline fine sandy loam, 2 to 7 percent slopes
12D2	Caroline fine sandy loam, 15 to 25 percent slopes, eroded
13B2	Caroline-Dogue complex, 2 to 7 percent slopes, eroded
13C2	Caroline Dogue complex, 7 to 15 percent slopes, eroded
14B2	Cecil fine sandy loam, 2 to 7 percent slopes, eroded
14C2	Cecil fine sandy loam, 7 to 15 percent slopes, eroded
15B2	Cecil-Vance gravelly sandy loams, 2 to 7 percent slopes, eroded
15C2	Cecil-Vance gravelly sandy loams, 7 to 15 percent slopes, eroded
15D2	Cecil-Vance gravelly sandy loams, 15 to 25 percent slopes, eroded
16	Chewacla fine sandy loam
17B	Colfax fine sandy loam, 2 to 7 percent slopes
17C	Colfax fine sandy loam, 7 to 15 percent slopes
18	Coxville loam
19B	Creedmoor fine sandy loam, 2 to 7 percent slopes
20B	Creedmoor Variant fine sandy loam, 2 to 7 percent slopes
21B2	Cullen loam, 2 to 7 percent slopes, eroded
21C2	Cullen loam, 7 to 15 percent slopes, eroded
21D2	Cullen loam, 15 to 25 percent slopes, eroded
22	Dawhoo Variant fine sandy loam
23	Dogue loam
24	Dunbar fine sandy loam
25A	Duplin fine sandy loam, 0 to 2 percent slopes
25B	Duplin fine sandy loam, 2 to 7 percent slopes
26B	Edgehill Variant very gravelly sandy loam, 2 to 7 percent slopes
27B	Fluvanna silt loam, 2 to 7 percent slopes
27C2	Fluvanna silt loam, 7 to 15 percent slopes, eroded
28	Fluvaquents, nearly level*
29	Forestdale loam
30	Forestdale loam, frequently flooded
31	Fork fine sandy loam
32B	Georgeville loam, 2 to 7 percent slopes
32C2	Georgeville loam, 7 to 20 percent slopes, eroded
33B	Goldsboro fine sandy loam, 0 to 4 percent slopes
34B	Goldsboro fine sandy loam, overwash, 0 to 4 percent slopes
35B	Helena-Colfax complex, 2 to 7 percent slopes
36C	Helena-Orange complex, 7 to 15 percent slopes
37	Hydraquents, nearly level*
38C	Iredell-Orange complex, 7 to 15 percent slopes
39B	Kempsville gravelly fine sandy loam, 2 to 7 percent slopes
39C	Kempsville gravelly fine sandy loam, 7 to 15 percent slopes
40A	Kempsville-Bourne fine sandy loams, 0 to 2 percent slopes
40B	Kempsville-Bourne fine sandy loams, 2 to 7 percent slopes
41	Kenansville loamy sand, 2 to 7 percent slopes
42	Kenansville Variant loamy sand
43	Lenoir loam
44B	Masada fine sandy loam, 2 to 7 percent slopes
45B	Mayodan-Creedmoor complex, 2 to 7 percent slopes
46	Myatt Variant fine sandy loam
47A	Norfolk fine sandy loam, 0 to 2 percent slopes
47B	Norfolk fine sandy loam, 2 to 7 percent slopes
48B	Orange-Iredell complex, 2 to 7 percent slopes
49B	Orangeburg fine sandy loam, 2 to 7 percent slopes
50A	Orangeburg-Faceville fine sandy loams, 0 to 2 percent slopes
50B	Orangeburg-Faceville fine sandy loams, 2 to 7 percent slopes
50C	Orangeburg-Faceville fine sandy loams, 7 to 15 percent slopes
51B2	Pacolet fine sandy loam, 2 to 7 percent slopes, eroded
51C2	Pacolet fine sandy loam, 7 to 15 percent slopes, eroded
51D2	Pacolet fine sandy loam, 15 to 25 percent slopes, eroded
52C3	Pacolet clay loam, 7 to 15 percent slopes, severely eroded
53B	Pacolet-Cecil gravelly sandy loams, 2 to 7 percent slopes
53C2	Pacolet-Cecil gravelly sandy loams, 7 to 15 percent slopes, eroded
54B	Pamunkey loamy sand, 2 to 7 percent slopes
55A	Pamunkey fine sandy loam, 0 to 2 percent slopes
55B	Pamunkey fine sandy loam, 2 to 7 percent slopes
56	Pamunkey fine sandy loam, occasionally flooded
57B	Pamunkey Variant gravelly sandy loam, 0 to 4 percent slopes
58C	Pinkston-Mayodan sandy loams, 7 to 15 percent slopes
58D	Pinkston-Mayodan sandy loams, 15 to 25 percent slopes
58E	Pinkston-Mayodan sandy loams, 25 to 45 percent slopes
59	Pits, borrow
60	Pits, quarry
61	Rains fine sandy loam
62B	Spotsylvania-Bourne fine sandy loams, 2 to 7 percent slopes
62C	Spotsylvania-Bourne fine sandy loams, 7 to 15 percent slopes
63A	Suffolk loamy fine sand, 0 to 2 percent slopes
63B	Suffolk loamy fine sand, 2 to 7 percent slopes
63C	Suffolk loamy fine sand, 7 to 15 percent slopes
64B	Tarboro loamy sand, 2 to 7 percent slopes
65B	Turbeville fine sandy loam, 2 to 7 percent slopes
66C	Udalfs-Ochrepts complex, sloping*
66D	Udalfs-Ochrepts complex, moderately steep*
66F	Udalfs-Ochrepts complex, steep*
67	Udifluvents, nearly level*
68	Udorthents, smoothed
69C	Udults, sloping*
69D	Udults, moderately steep*
70B	Udults-Ochrepts complex, gently sloping*
70C	Udults-Ochrepts complex, sloping*
70D	Udults-Ochrepts complex, moderately steep*
70E	Udults-Ochrepts complex, steep*
70F	Udults-Ochrepts complex, very steep*
71B	Vance fine sandy loam, 2 to 7 percent slopes
71C2	Vance fine sandy loam, 7 to 15 percent slopes, eroded
72B	Varina-Bourne complex, 2 to 7 percent slopes
73	Wahee loam
74B2	Wedowee fine sandy loam, 2 to 7 percent slopes, eroded
74C2	Wedowee fine sandy loam, 7 to 15 percent slopes, eroded
74D2	Wedowee fine sandy loam, 15 to 30 percent slopes, eroded
75C3	Wedowee clay loam, 7 to 15 percent slopes, severely eroded
75D3	Wedowee clay loam, 15 to 25 percent slopes, severely eroded
76D	Wedowee-Ashlar complex, 15 to 25 percent slopes
77	Wehadkee loam
78	Worsham fine sandy loam

*The composition of these units is more variable than others in the survey area, but has been controlled well enough to be interpreted for the expected uses of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (78)
- Federal (610)
- State (52)
- County, farm or ranch (278)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water)
- Intermittent (land)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA, FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Cut and fill land 2 acres or less
- Pit, clay 10 acres or less
- Borrow pit 5 acres or less

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 1

HANOVER COUNTY, VIRGINIA NO. 1

This map is controlled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 225 000 FEET

610 000 FEET

SPOTSYLVANIA COUNTY

NORTH ANNA RIVER

LOUISA COUNTY

Rouzie Chapel

(Joins sheet 2)

600 000 FEET

(Joins sheet 3)

2 240 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 2

2

N

1 Mile

5 000 Feet

Scale 1:15 840

2 260 000 FEET

610 000 FEET

600 000 FEET

2 245 000 FEET

SPOTSYLVANIA COUNTY

CAROLINE COUNTY

NORTH ANNA RIVER

Hogan Creek

(Joins sheet 1)

(Joins sheet 4)

16 66F 66D 75D3 25B 12C 1B 18B2 47B 50B 74C2 51C2 11C 14B2 74D2 51B2 75C3 52C3 14C2 74B2 51D2 66D

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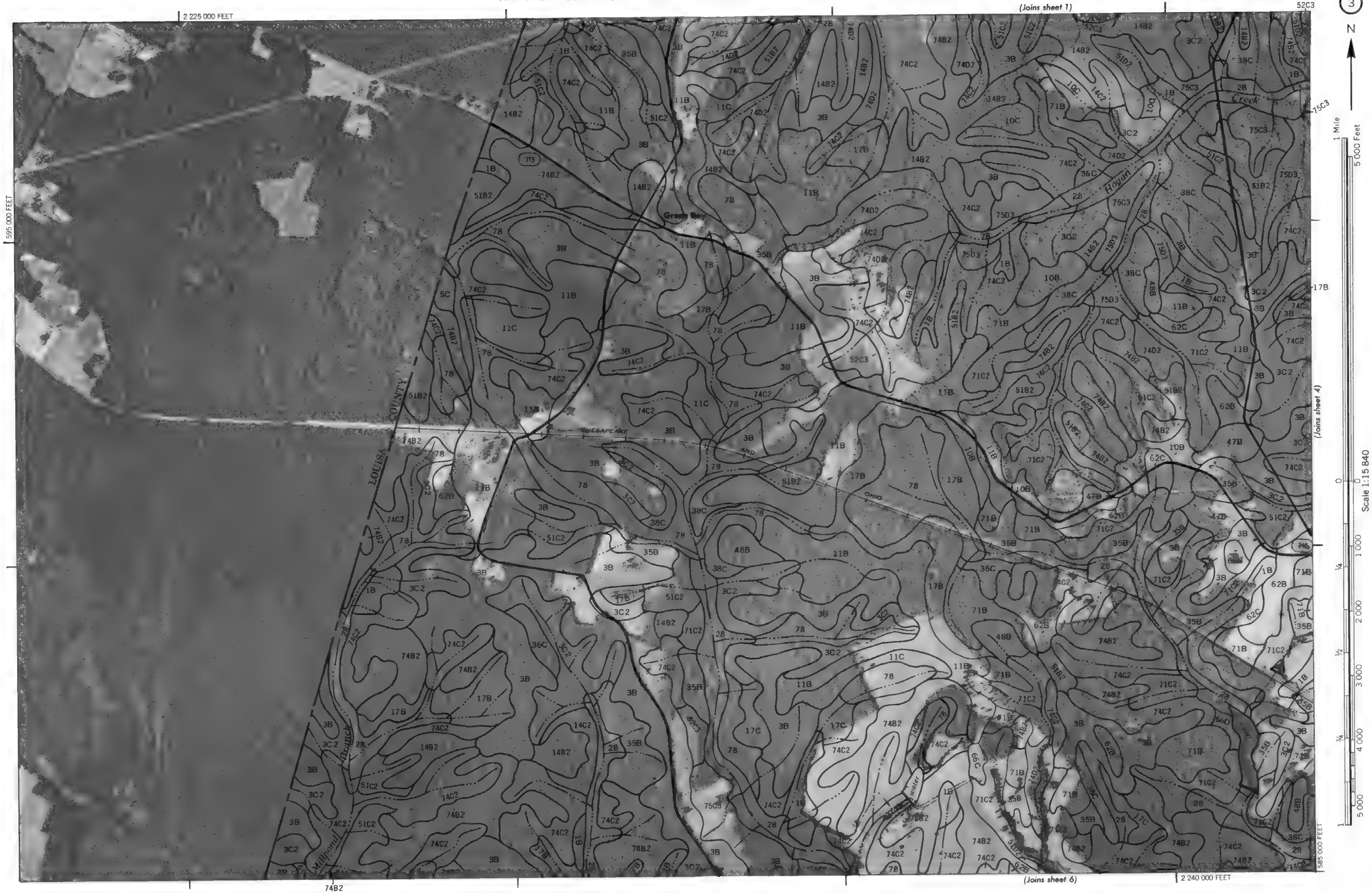
HANOVER COUNTY, VIRGINIA NO. 2



HANOVER COUNTY, VIRGINIA NO. 3

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4

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

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HANOVER COUNTY, VIRGINIA NO 4

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 5

HANOVER COUNTY, VIRGINIA NO 5

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Coordinate grid ticks and land division corners if shown are approximately positioned

2 205 000 FEET

507 000 FEET

2000 AND 5000-FOOT GRID TICKS

(Joins sheet 32)

2 220 000 FEET

505 000 FEET

(Joins sheet 40)

2 265 000 FEET

590 000 FEET

(Joins sheet 4)

585 000 FEET

2 270 000 FEET

(Joins sheet 8)

GOOCHLAND COUNTY

CAROLINE COUNTY

NORTH ANNA RIVER

5

N

1 Mile

5 000 Feet

Scale 1:15 840

6

N

1 Mile

5 000 Feet

0

Scale 1:15 840

1/4

1 000

1/2

2 000

3/4

3 000

1

4 000

5 000

(Joins sheet 3)

2 240 000 FEET

585 000 FEET

575 000 FEET

(Joins insel, sh 19)

2 225 000 FEET

(Joins sheet 9)

(Joins sheet 7)

LOUISA COUNTY

Little River

Hollowing Creek

Fleming Millpond

Creek

Creek

Creek

Creek

Locust

Terrell Store

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Coordinate grid ticks and land division corners shown are approximately positioned

HANOVER COUNTY, VIRGINIA NO 6

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 7

HANOVER COUNTY, VIRGINIA NO 7

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Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 245 000 FEET

585 000 FEET

(Joins sheet 4)

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 10)

575 000 FEET

2 260 000 FEET

Teman

United Church

Holliday

Beaverdam School

Terrell Store

Beaverdam Creek

Little River

7

N

1 Mile

5 000 Feet

Scale 1:15 840

8

N

(Joins sheet 5)

53B

2 280 000 FEET

NORTH ANNA

CAROLINE COUNTY

RIVER

CHESAPEAKE AND

Hewlett

Elon

Noel

water

580 000 FEET

575 000 FEET

(Joins sheet 7)

(Joins sheet 11)

2 265 000 FEET

17B

(Joins inset, sheet 13)

21C2

50B

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

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Coordinate grid ticks and land division corners, if shown, are approximately plotted

HANOVER COUNTY, VIRGINIA NO. 8

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 9

9

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾

HANOVER COUNTY, VIRGINIA NO 9

This map is compiled on 1:15 840 aerial photographs by the U S Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and grid values on corners 1 shown are approximately positioned

14B2 | 2 225 000 FEET | 51C2 | (Joins sheet 6) 35B

570 000 FEET

Creek | Horse | Creek | Creek | Old Bandana | Shiloh Church | Moodys Corner | Swamp | Creek

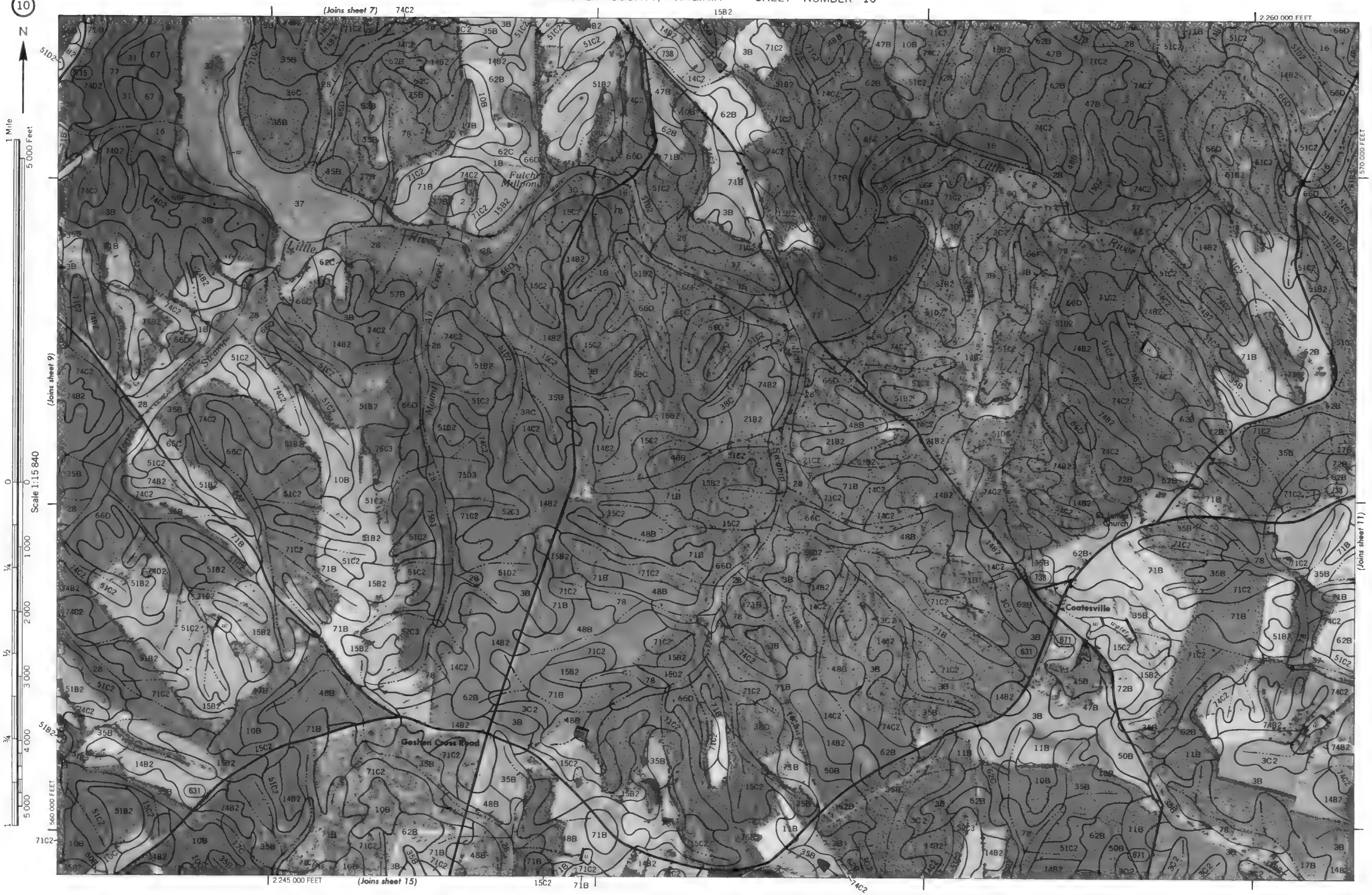
(Joins inset, sheet 19)

(Joins sheet 10)

560 000 FEET

62B | 51C2 | 38C | 38C | (Joins sheet 14) | 47B | 2 240 000 FEET | 15C2

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 10



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO. 10

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 11

11

N

(Joins sheet 8)

2 265 000 FEET

570 000 FEET

Mt Carmel Church

Little River

Rinct

water

(Joins sheet 10)

(Joins sheet 12)

(Joins sheet 16)

560 000 FEET

2 280 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

HANOVER COUNTY, VIRGINIA NO 11

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and and division corners if shown are approximately positioned

12

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins inset, sheet 13)

(Joins sheet 11)

(Joins sheet 17)

(Joins sheet 13)

2 300 000 FEET

570 000 FEET

560 000 FEET

2 285 000 FEET

North Anna

Verdon

NORTH ANNA RIVER

CAROLINE COUNTY

Little River

Chesapeake and Ohio Railroad

Richmond, Fredericksburg and Potomac Railroad

Built Rum Creek

685

684

This map is compiled on 1:15 840 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land lines on corners shown, are approximately 1 000 feet

HANOVER COUNTY, VIRGINIA NO. 13

This map is compiled on 1973 aerial photography by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

2 305 000 FEET

570 000 FEET

2 281 000 FEET

578 000 FEET

575 000 FEET

560 000 FEET

2 315 000 FEET

2 285 000 FEET

CAROLINE COUNTY

NORTH ANNA RIVER

Bull Run

RICHMOND, FREDERICKSBURG AND POTOMAC

(Joins sheet 12)

(Joins sheet 18)

70C (Joins sheet 12)

66D

3000 AND 4000-FOOT GRID TICKS

13

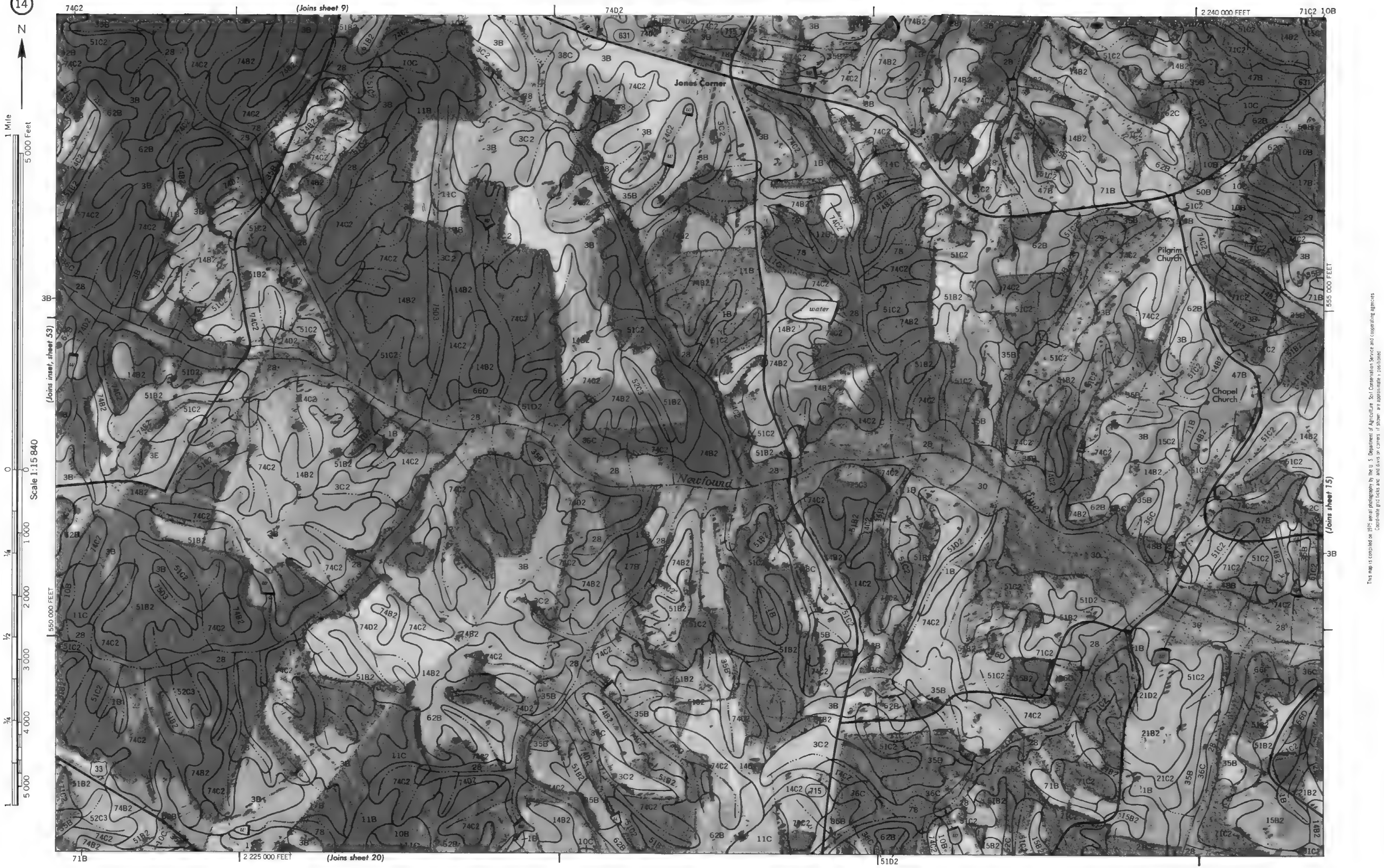
N

1 Mile

5000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 14



HANOVER COUNTY, VIRGINIA NO. 15

This map is compiled on 1975 aerial photography by the U. S. Department of Agric., Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners ↑ shown, are approximately positioned

2 245 000 FEET

555 000 FEET

(Joins sheet 10)

(Joins sheet 16)

(Joins sheet 14)

(Joins sheet 21)

2 260 000 FEET

550 000 FEET

Newfound River

Gwaltney Church

15

N

1 Mile

5 000 Feet

Scale 1:15 840

16

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 11)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 22)

2 280 000 FEET

555 000 FEET

550 000 FEET

2 265 000 FEET

Newfound River

Beaver Creek

Campbells Pond

The Church of Truth

Old Fork Church

water

This map was compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Soil boundaries are approximately placed.
Coordinate grid ticks and grid division centers, if shown, are approximately placed. 1000

HANOVER COUNTY, VIRGINIA NO 16

HANOVER COUNTY, VIRGINIA NO. 17

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 285 000 FEET

555 000 FEET

25B | 47B (Joins sheet 12)

(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 23)

58E

55B 2 300 000 FEET 47B

Doswell

Mt Hebron Church

Jerusalem Church

Hanover Academy

Little River

Little River

water

550 000 FEET

17

N

1 Mile

5 000 Feet

Scale 1:15 840

1 5 000 ¾ 4 000 ½ 3 000 ¼ 2 000 0 1 000 0 1 000 2 000 3 000 4 000 5 000 FEET

(18)

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 13)

2 315 000 FEET

555 000 FEET

(Joins sheet 17)

550 000 FEET

70C (Joins sheet 24) 2 305 000 FEET 55B

Dabwell

Garnett

CAROLINE COUNTY

NORTH ANNA RIVER

CHESAPEAKE & OHIO

SEABOARD

water

This map is compiled on 1972 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 18

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 19

HANOVER COUNTY, VIRGINIA NO. 19

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 217 000 FEET

570 000 FEET

560 000 FEET

2 220 000 FEET

3000 AND 5000-FOOT GRID TICKS

(Joins sh6)

(Joins sheet 9)

(Joins inset, sheet 53)

2 215 000 FEET

545 000 FEET

535 000 FEET

(Joins inset, sheet 53)

(Joins sheet 20)

(Joins sheet 25)

2 220 000 FEET

Rocky Creek

COUNTY

LOUISA

Taylors Creek

Hopeful Church

631

14B2

51C2

19

N

1 Mile

5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 20

20

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 19)

(Joins sheet 14)

(Joins sheet 21)

(Joins sheet 26)

2 240 000 FEET

2 225 000 FEET

545 000 FEET

535 000 FEET

Montpelier

Bethany Church

Bethany School

Carroll Creek

Fork

Creek

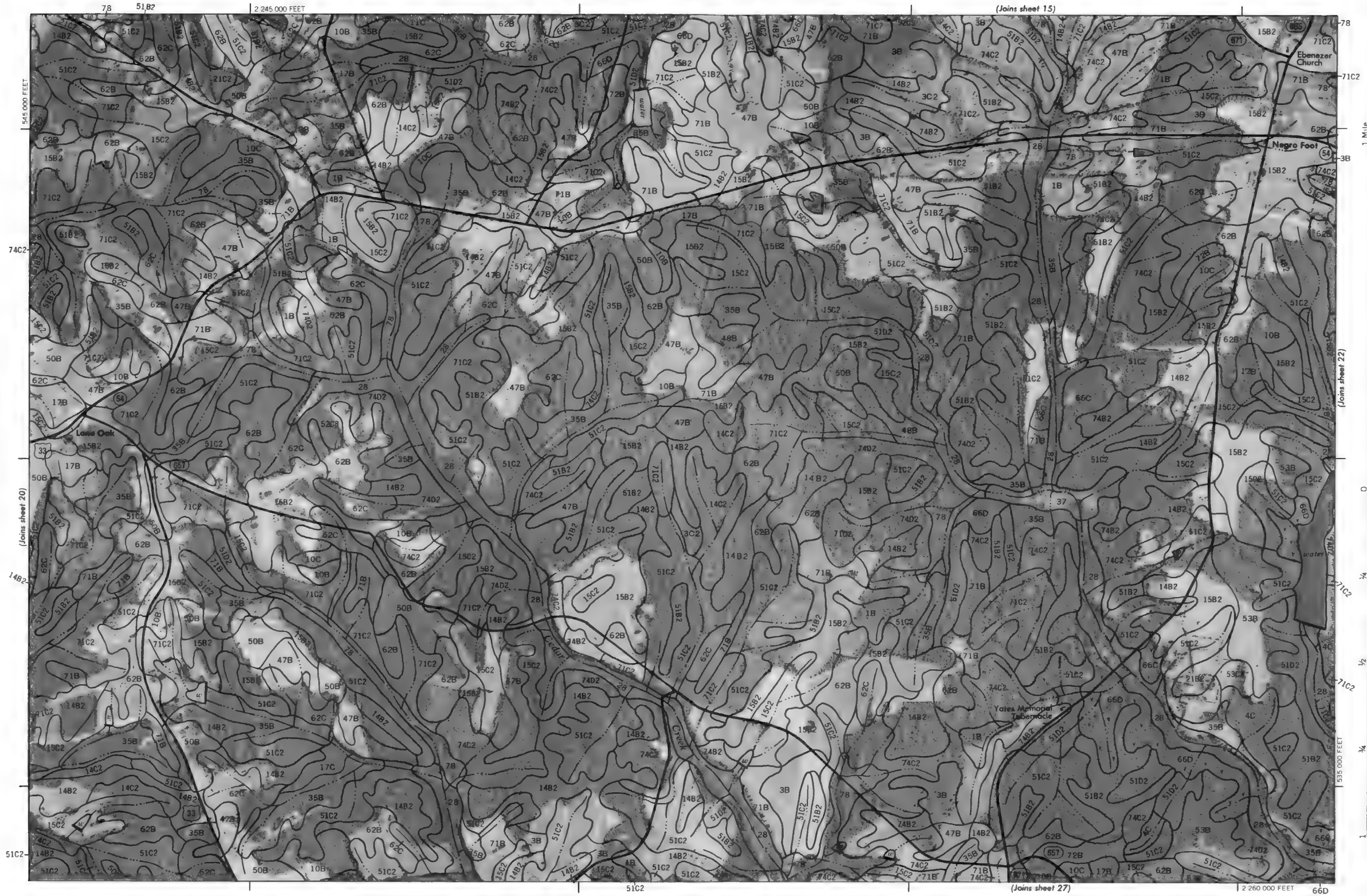
water

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
shown. are approximately 2,000 feet and land divisions corners " shown. are approximately 1,000 feet
Coordinate grid lines and land divisions corners " shown. are approximately 1,000 feet

VIRGINIA NO. 20

HANOVER COUNTY, VIRGINIA

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 21



HANOVER COUNTY, VIRGINIA NO. 21

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners if shown are approximately positioned

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 22

22

N

(Joins sheet 16)

2 280 000 FEET

545 000 FEET

Negro Foot

(Joins sheet 21)

(Joins sheet 23)

535 000 FEET

(Joins sheet 28)

2 265 000 FEET

SOUTH ANNA RIVER

1 Mile

5 000 Feet

Scale 1:15 840

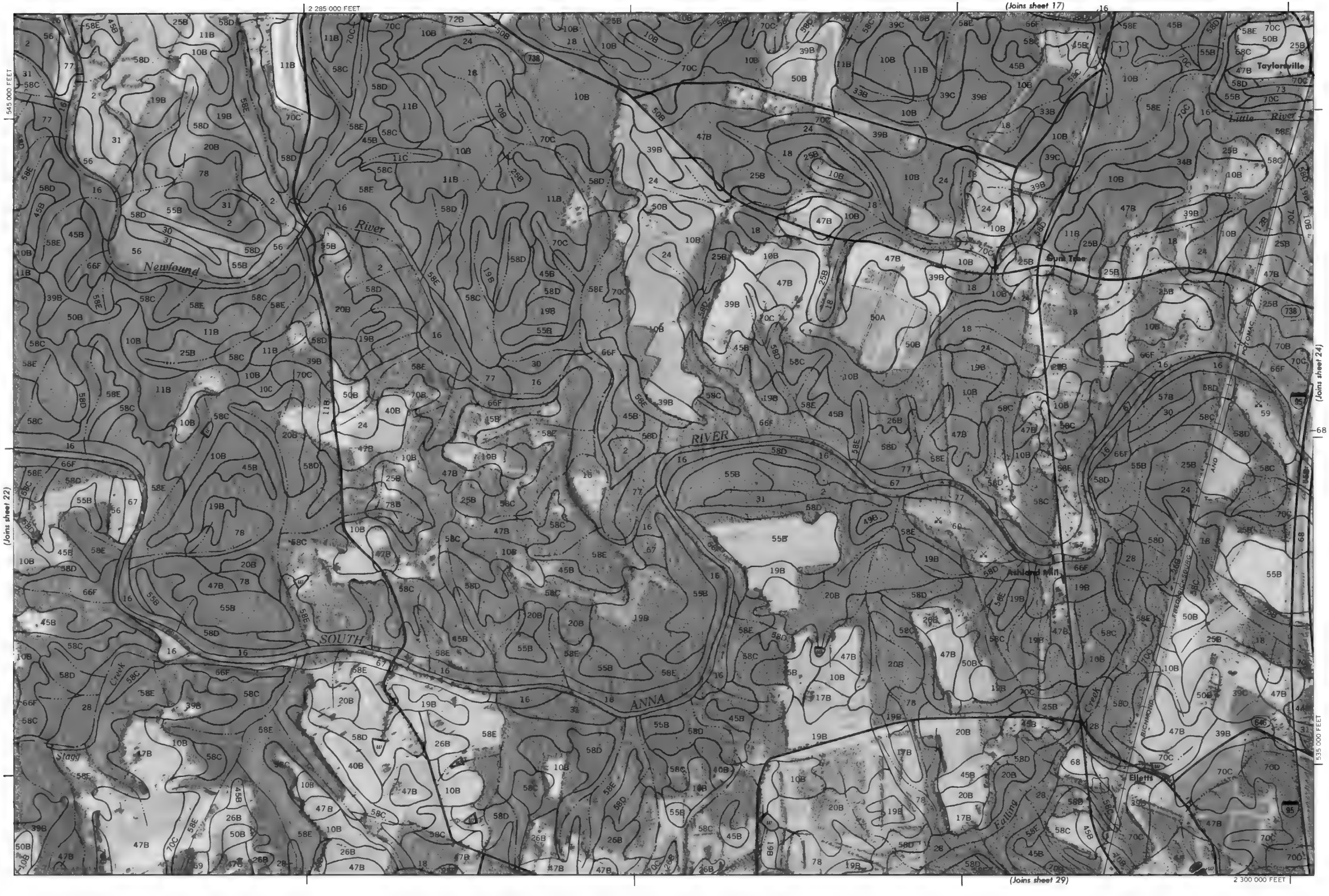
0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks are based on true corners of shown are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 22

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 23

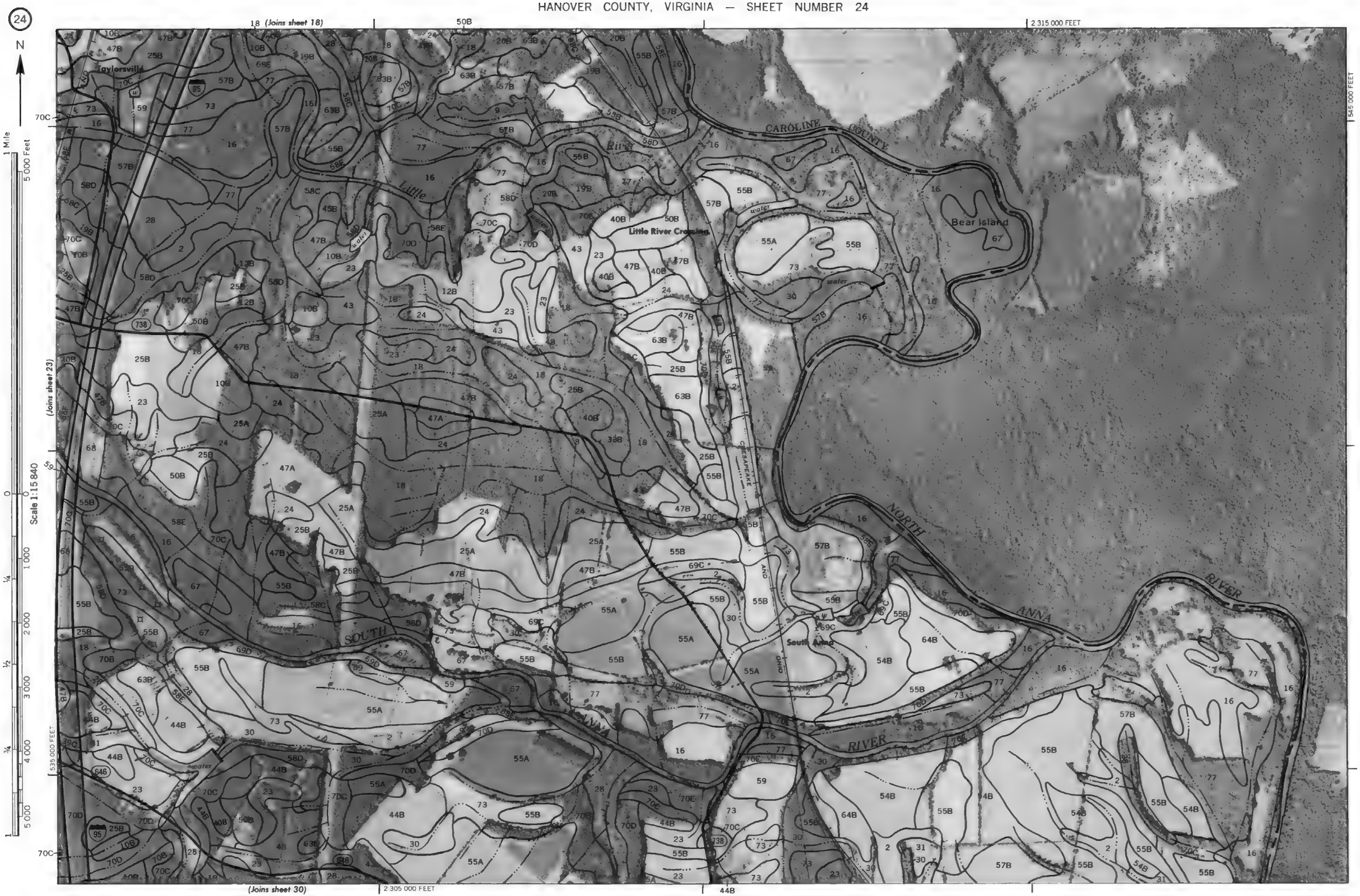


23

N

HANOVER COUNTY, VIRGINIA NO. 23

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Control mate grid ticks and land division corners, if shown, are approximately positioned



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Cartesian grid ticks and land division corners, if shown are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 24

HANOVER COUNTY, VIRGINIA NO 25

This map is compiled on 1975 aerial photography by the U S Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 205 000 FEET

530 000 FEET

(Joins sheet 19)

LOUISA COUNTY

ANNA RIVER

SOUTH

Turkey Creek

water

525 000 FEET

(Joins sheet 26)

51C2

15B2 (Joins sheet 32)

15C2

2 220 000 FEET

25

N

1 Mile

5 000 Feet

Scale 1:15 840

0 5 000 1 000 ¼ 2 000 ½ 3 000 ¾ 4 000 1

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 26

26

N

(Joins sheet 20)

35B

2 240 000 FEET

530 000 FEET

(Joins sheet 25)

(Joins sheet 27)

525 000 FEET

2 225 000 FEET

(Joins sheet 33)

10B

Taylors Creek

Pond Creek

Swamp

Gouldin

Dupns Chapel

SOUTH ANNA RIVER

611

1 Mile

5 000 Feet

Scale 1:15 840

1 0 0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾

This map was compiled on 1975 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks are at intervals of 1 000 meters. Roads and stream courses are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 26

HANOVER COUNTY VIRGINIA NO 27
This map is compiled from 1:14" aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and grid division corners (+) shown are approximately plotted

2 245 000 FEET

530 000 FEET

74C2

(Joins sheet 21)

74D2

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 34)

2 260 000 FEET

525 000 FEET

Goodall

St Peters Church

Taylors Creek

SOUTH ANNA RIVER

Cedar Creek

27

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

5 000 4 000 3 000 2 000 1 000 0

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 28

28

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 22)

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 35)

2 280 000 FEET

530 000 FEET

525 000 FEET

2 265 000 FEET

SOUTH ANNA RIVER

Beech Creek

Gilman

Greenwood Church

Patrick Henry High School

Dog Branch

Stony Water

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 28

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 29

29

N

(Joins sheet 23)

(Joins sheet 30)

(Joins sheet 28)

(Joins sheet 36)

2 285 000 FEET

530 000 FEET

525 000 FEET

2 300 000 FEET

Independence Church

Kings Pond

Ashland Christian Church

Union Church

Gandy High School

Randolph-Macon College

ASHLAND

Falling Creek

Stony Run

CSX

RICHMOND, FREDERICKSBURG & POTOMAC

water

1 Mile

5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA NO 29

This map is compiled on 1915 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 30

30

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 24)

(Joins sheet 29)

(Joins sheet 31)

(Joins sheet 37)

2 315 000 FEET

2 305 000 FEET

530 000 FEET

525 000 FEET

CAROLINE COUNTY

NORTH ANNA RIVER

Wickham Crossing

Hanover Academy

Creek

CHESAPEAKE AND OHIO

This map is compiled on 1975 aerial photography by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO 30

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 31

(Joins inset A, sheet 39)

2 320 000 FEET

530 000 FEET

2 339 000 FEET

527 000 FEET

525 000 FEET

2 340 000 FEET

1000 AND 2000-FOOT GRID TICKS

(Joins lower right)

(Joins sheet 30)

(Joins sheet 38)

(Joins inset)

2 335 000 FEET

525 000 FEET

CAROLINE CO

KING WILLIAM COUNTY

CAROLINE COUNTY

NORTH ANNA RIVER

LITTLEPAGE BRIDGE

Corinth Church

HANOVER (county seat)

St Pauls Church

Blanton Crossing

Winchumps

water

CHESAPEAKE & OHIO

301

54

646

31

N

1 Mile

5 000 Feet

0 0

1:15 840

Scale 1:15 840

1 000 ¼

2 000 ½

3 000 ¾

4 000 1

5 000 1¼

HANOVER COUNTY, VIRGINIA NO. 31

This map is comp. ed on 1975 aer a photography by the U. S. Department of Agriculture Soi Conservation Service and cooperating agencies
Coordinate grid ticks and land d ns are approximately post ioned

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 32

32

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 25)

2 220 000 FEET

520 000 FEET

510 000 FEET

2 205 000 FEET

(Joins inset, sheet 5)

(Joins sheet 33)

LOUISA COUNTY

GOOCHLAND CO.

Springfield Church

Turkey Creek

Mill Creek

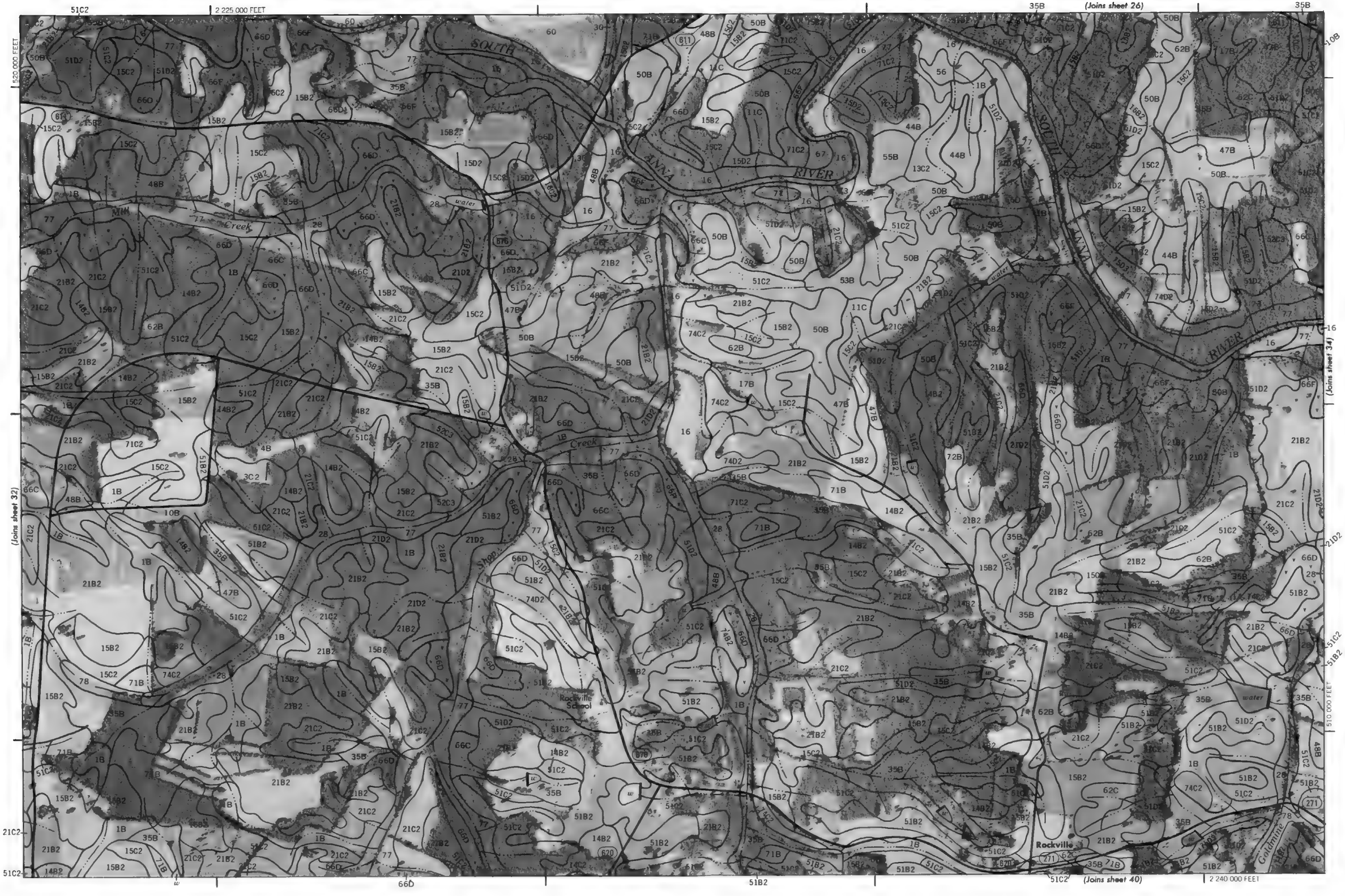
water

This map was compiled on 1975 aerial photography by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners if shown are approximately positioned

HANOVER COUNTY, VIRGINIA NO 32

HANOVER COUNTY, VIRGINIA NO. 33

This map was compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned



34

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

35B (Joins sheet 27) 51C2 28 66F 15B2 71C2 2 260 000 FEET

520 000 FEET

(Joins sheet 33)

510 000 FEET

(Joins sheet 35)

(Joins sheet 41) 2 245 000 FEET 28

Taylors Creek

ANNA RIVER

SOUTH ANNA

Stone Creek

Casco

Goldmine

GROUND SQUIRREL BRIDGE

This map is compiled on 1975 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 34

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 35

N

2 265 000 FEET

520 000 FEET

(Joins sheet 28)

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 42)

2 280 000 FEET

510 000 FEET

Lanes' Corner

Liberty Church

Harrington

Forest Grove Church

Beaver Creek

Crossy Swamp

Stodge Creek

1 Mile

5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA NO 35

This map was compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land divisions corners, if shown, are approximately positioned

36

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 29)

(Joins sheet 35)

(Joins sheet 43)

(Joins sheet 37)

2 300 000 FEET

520 000 FEET

510 000 FEET

2 285 000 FEET

ASHLAND

Stony Run

Gwathmey

Calvary Tabernacle

Henry Clay School

Shiloh Church

This map is compiled on 1975 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO. 37

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown are approximately positioned

2 305 000 FEET

520 000 FEET

(Joins sheet 30)

(Joins sheet 38)

(Joins sheet 36)

510 000 FEET

2 315 000 FEET

(Joins sheet 44)

37

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 38

38

N

(Joins sheet 31)

2 335 000 FEET

520 000 FEET

16

1 Mile

5 000 Feet

Scale 1:15 840

0

1/4 1 000

1/2 2 000

3/4 4 000

1 5 000

(Joins sheet 37)

510 000 FEET

2 320 000 FEET

(Joins sheet 45)

(Joins sheet 39)

Hanover School For Boys

KING WILLIAM COUNTY

Mechumps Creek

Campbell Creek

Cady Lake

Crosses Corner

Peaks

Cady

water

605

657

857

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 38

N

2 340 000 FEET

520 000 FEET

KING WILLIAM COUNTY

RIVER

Crump Neck

NORTH ANNA

Crump Creek

KING WILLIAM COUNTY

(Joins sheet 38)

(Joins sheet 46)

INSET A

2 330 000 FEET

535 000 FEET

534 000 FEET

RIVER

CAROLINE COUNTY

NORTH ANNA

(Joins sheet 31)

2 335 000 FEET

1000 AND 5000-FOOT GRID TICKS

INSET B

(Joins sheet 58)

2 335 000 FEET

456 000 FEET

455 000 FEET

HENRICO COUNTY

CHICKAHOMINY RIVER

(Joins 62)

2 338 000 FEET

1000 AND 3000-FOOT GRID TICKS

510 000 FEET

KING WILLIAM COUNTY

2 355 000 FEET

1 Mile

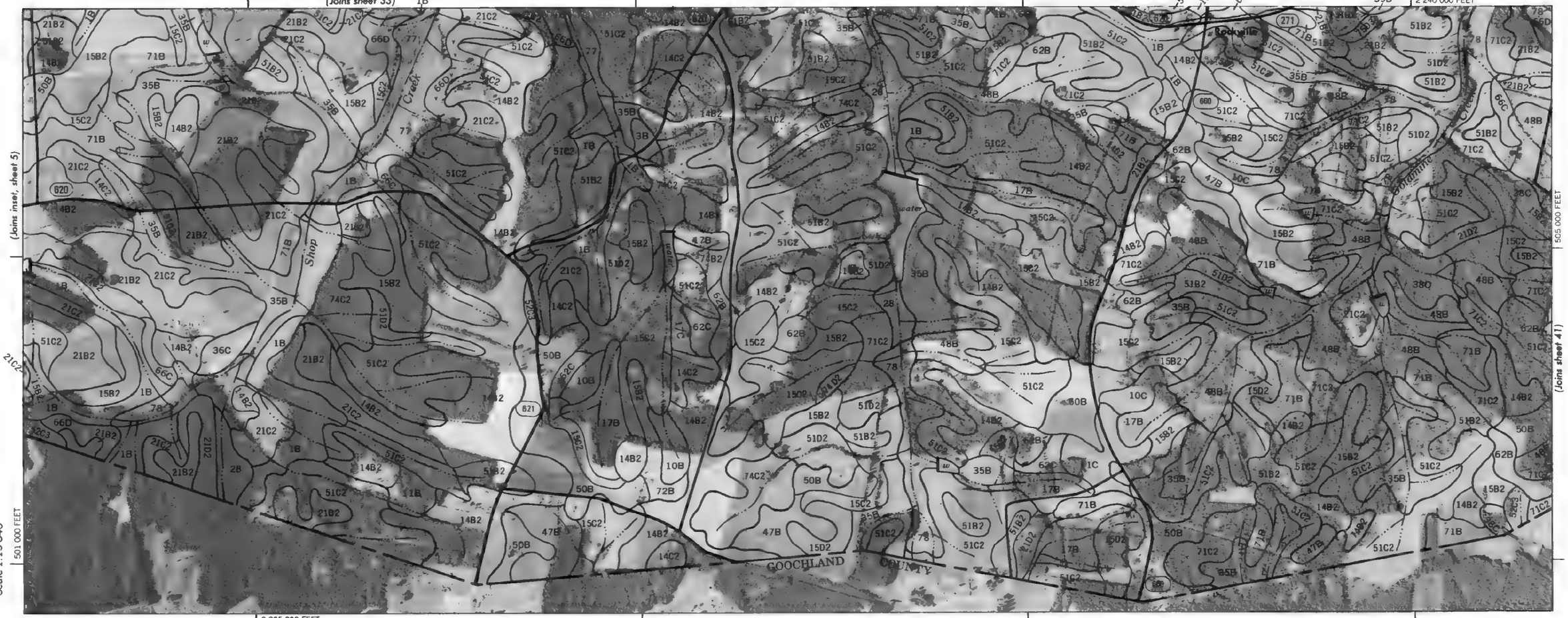
5 000 Feet

Scale 1:15 840

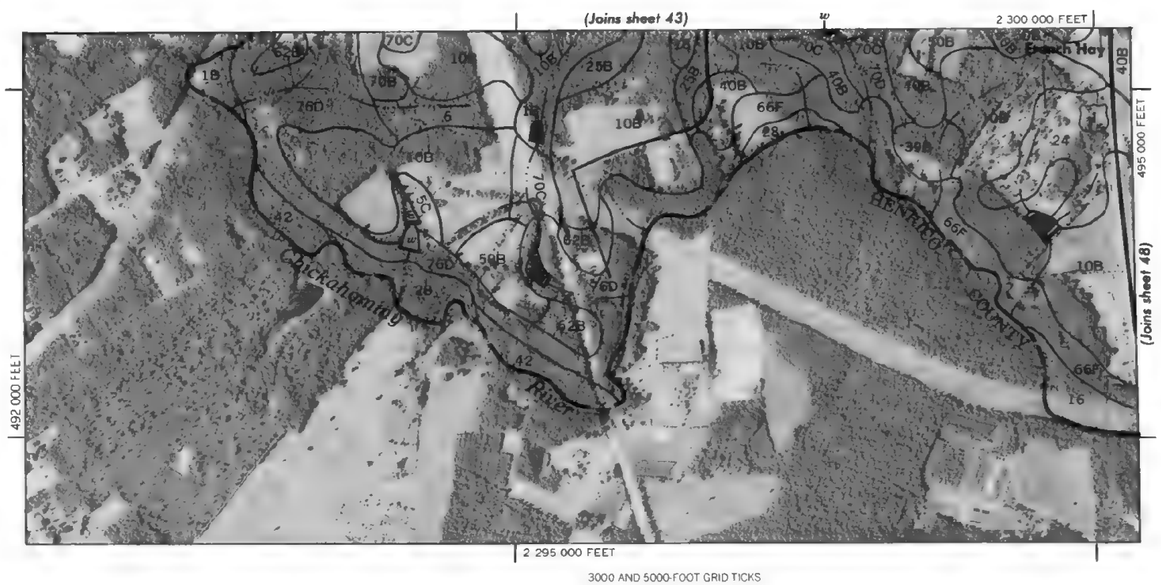
HANOVER COUNTY, VIRGINIA NO. 39

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 40



4000 AND 5000-FOOT GRID TICKS



3000 AND 5000-FOOT GRID TICKS

1 Mile
5 000 Feet
Scale 1:15 840
501 000 FEET

This map was compiled on 1975 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 40

HANOVER COUNTY, VIRGINIA NO. 41

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

3000 AND 5000-FOOT GRID TICKS

41

N

1 Mile 5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 42

42

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 35)

(Joins sheet 41)

(Joins sheet 43)

(Joins inset, sheet 41)

2 280 000 FEET

505 000 FEET

495 000 FEET

2 265 000 FEET

Chickahominy River

Black Haw Branch

Grassy Swamp

Grassy Swamp Creek

Chickahominy Church

Chamberlayne Lake

HENRICO COUNTY

HANOVER COUNTY

water

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and grid division numbers, if shown are approximately correct

HANOVER COUNTY, VIRGINIA NO 42

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 43

43

N

(Joins sheet 36)

(Joins sheet 44)

(Joins sheet 42)

(Joins inset, sheet 40)

6 | 2 285 000 FEET

505 000 FEET

495 000 FEET

2 300 000 FEET

Elmont

Kentwood

Chickahominy

HENRICO COUNTY

Lewistown

Scale 1:15 840

1 Mile

5 000 Feet

HANOVER COUNTY, VIRGINIA NO 43

This map was compiled on 1975 aerial photography by the U S Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners if shown, are approximately positioned

(44)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

(Joins sheet 37)

(Joins sheet 43)

(Joins sheet 48)

(Joins sheet 45)

2 315 000 FEET

505 000 FEET

495 000 FEET

2 300 000 FEET

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid tracks and land division corners, if shown, are approximately y joined

HANOVER COUNTY, VIRGINIA NO. 44

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 45

HANOVER COUNTY, VIRGINIA NO. 45

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks (and land division corners, if shown) are approximately positioned

2 320 000 FEET

505 000 FEET

495 000 FEET

2 335 000 FEET

(Joins sheet 38)

(Joins sheet 44)

(Joins sheet 46)

(Joins sheet 49)

45

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 46

46

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000 FEET

70B (Joins sheet 39) 2 355 000 FEET 16

505 000 FEET

(Joins sheet 45)

(Joins sheet 47)

495 000 FEET

2 340 000 FEET (Joins sheet 50)

KING WILLIAM COUNTY

NORTH ANNA RIVER

Crump Creek

Pollard Creek

Chestnut Grove Church

water

605

This map was compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners (if shown) are approximately positioned

HANOVER COUNTY, VIRGINIA NO 46

HANOVER COUNTY, VIRGINIA NO. 47

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 360 000 FEET

(Joins inset A)

505 000 FEET

16

NORTH ANNA RIVER

KING WILLIAM COUNTY

Mattaponi Creek

Hanovertown

605

(Joins sheet 46)

(Joins sheet 51)

43

70F

69D

62B

2 375 000 FEET

INSET A

2 360 000 FEET

510 000 FEET

508 000 FEET

2 365 000 FEET

(Joins upper left)

2000 AND 5000-FOOT GRID TICKS

INSET B

2 397 000 FEET

(Joins inset A, (sh 52)

478 000 FEET

(Inset A, sh 52)

NEW KENT COUNTY

(Joins sheet 57)

475 000 FEET

2 399 000 FEET

2000 AND 5000-FOOT GRID TICKS

(Joins inset B, sheet 52)

500 000 FEET

47

N

1 Mile

5 000 Feet

Scale 1:15 840

48

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

2 300 000 FEET

2 315 000 FEET

(Joins sheet 44)

(Joins inset, sheet 40)

12D2

47A

490 000 FEET

485 000 FEET

482 000 FEET

2 402 000 FEET

2 400 000 FEET

(Joins inset A, sheet 52)

(Joins sheet 52)

(Joins sheet 49)

(Joins sheet 53)

2000 AND 3000-FOOT GRID TICKS

HENRICO COUNTY

Chickahominy River

North Anna River

Pottoms Church

Atlee

Cool Spring Church

Croney Island Estates

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Control nate grid ticks and and div sion corners. f shown are approximate positions

HANOVER COUNTY, VIRGINIA NO. 48

HANOVER COUNTY, VIRGINIA NO. 49

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land divisions on corners, if shown, are approximately positioned

2 320 000 FEET

490 000 FEET

(Joins sheet 45)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 54)

485 000 FEET

2 335 000 FEET

Patrick Henry Heights

Pearsons Corner School

Pearsons Corner

Henry Clay Heights

Colonial Forest

Oak Forest

Rural Point

Laurel Grove Estates

Pamunkey

Pamunkey Creek

Totopotomoy

Totopotomoy Creek

water

49

N

1 Mile

5 000 Feet

Scale 1:15 840

50

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 46)

(Joins sheet 49)

(Joins sheet 51)

(Joins sheet 55)

2 355 000 FEET

2 340 000 FEET

490 000 FEET

485 000 FEET

18

Pollard Creek

Second Union Church

Mantilo Creek

Totopotomoy Creek

water

606

604

This map is compiled on 1935 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately point ones

HANOVER COUNTY, VIRGINIA NO. 50

HANOVER COUNTY, VIRGINIA NO. 51

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(Joins sheet 47)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 56)

2 360 000 FEET
2 375 000 FEET
490 000 FEET
485 000 FEET

Totopotomoy Creek
NORTH ANNA RIVER
KING WILLIAM COUNTY
HANOVER COUNTY
Turner Corner

51
N

1 Mile
5 000 Feet

Scale 1:15 840

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO. 52

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 215 000 FEET

(Joins inset, sheet 19)

555 000 FEET

LOUISA COUNTY

Newfound River

water

Mabelton

(Joins sheet 14)

550 000 FEET

(Joins sheet 19)

2 220 000 FEET

2 310 000 FEET

(Joins sheet 48)

480 000 FEET

Chickahominy River

Cooley Island Estates

HENRICO COUNTY

Boxwood Farms

Ellerson

(Joins sheet 54)

470 000 FEET

2 315 000 FEET

(Joins inset, sheet 62)

53

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 54

54

N

301

2

(Joins sheet 49)

2 335 000 FEET

480 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

0

1

¼

2 000

½

3 000

¾

4 000

1 000

5 000

470 000 FEET

(Joins sheet 53)

(Joins sheet 55)

2 320 000 FEET

(Inset, sh 62)

(Joins sheet 58)

Washington Henry School

Academy

Borkeys Store

Pole Green

Pole Green Church

Pleasant Grove Church

Shady Grove Church

Oaresides Farms

Carneals Store

Mayfield Farms

Ellerson

Westhall Church

Degwood Knoll

Beaverdam Creek

Strawhorn Creek

Academy Creek

water

This map was compiled on 1975 aerial photography by the U S Department of Agriculture Soil Conservation Service cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY VIRGINIA NO 54

HANOVER COUNTY, VIRGINIA NO. 55

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 340 000 FEET

480 000 FEET

(Joins sheet 50)

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 59)

2 355 000 FEET

470 000 FEET

55

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 0 5 000 4 000 3/4 3 000 1/2 2 000 1/4 1 000 0

Pine Hill

East End School

First Union Church

Dogwood Knoll

Newman

Battlefield Park School

Shiloh Church

Talley Millpond

Gethsemane Church

Mattaponi

Crump Creek

Boundary Valley Creek

water

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 56

56

N

(Joins sheet 51)

2 375 000 FEET

480 000 FEET

(Joins sheet 55)

(Joins sheet 57)

470 000 FEET

2 360 000 FEET

(Joins sheet 60)

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

Linney Corner

New Bethesda Church

Old Church

Emanuel Church

Farmers Shop Corner

Wests Pond

Liggans Corner

Woodlawn

Beaties Mill

Matadequin Creek

Parsleys Creek

Swamp

water

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

HANOVER COUNTY, VIRGINIA NO. 56

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 57

57

N

2 380 000 FEET

480 000 FEET

(Joins sheet 52)

(Joins inset A, sheet 52)

(Joins sheet 56)

(Joins inset B, sheet 47)

470 000 FEET

(Joins sheet 61)

2 395 000 FEET

Farmview Sharp Corner

Zion Church

Bethlehem Church

Glimpses Corner

Eastern View

Flanagans Millpond

water

Pursells Ct

Matadequin Creek

Matadequin Creek

NEW KENT COUNTY

KING WILLIAM CO

NORTH-ANNA-K

606

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

HANOVER COUNTY, VIRGINIA NO. 57

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid, roads and land division corners, if shown, are approximately positioned

58

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 2 000 ½ 3 000 ¾ 4 000 1 5 000

(Joins inset, sheet 62)

2 335 000 FEET

(Joins sheet 54)

465 000 FEET

460 000 FEET

2 320 000 FEET

(Joins sheet 59)

(Joins inset B, sheet 39)

MECHANICSVILLE

Ellerson

Windy Hill Estates

Spring Meadows

Lee Davis High School

Dogwood Knoll

Brandy Creek Estates

Brandy Branch Mill

Ellerson Mill

Woods Grove Church

Fields Lake

Beaverdam Creek

Brandy Branch

HENRICO COUNTY

CHICKAHOMINY RIVER

This map is compiled on 1971 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and lines shown on corners of sheet are approximately 200 feet

HANOVER COUNTY, VIRGINIA NO. 58

HANOVER COUNTY, VIRGINIA NO. 59

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture. Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned

2 340 000 FEET

465 000 FEET

460 000 FEET

2 355 000 FEET

(Joins sheet 55)

(Joins sheet 58)

(Joins sheet 60)

(Joins sheet 62)

Daywood Knoll

Brandy Creek Estates

Spring Valley Creek

Beulah Church

Springfield Church

Cold Harbor Farms

Simpkins Corner

Gaines Mill Estates

Hanover Farms

Pamunkey Creek

Old Cold Harbor

Free Gospel Tabernacle

New Cold Harbor

Steeds Lake

59

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1 000 ¼ 2 000 ½ 3 000 ¾ 4 000 1 5 000

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 60

60

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 56)

2 375 000 FEET

465 000 FEET

460 000 FEET

2 360 000 FEET

(Joins sheet 59)

(Joins sheet 61)

(Joins sheet 63)

Parsleys Millpond

Alexanders Corner

Rock Hill Church

Wicker Corner

Sandy Level

Elder

Swamp

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO. 60

HANOVER COUNTY, VIRGINIA — SHEET NUMBER 61

61

N

2 380 000 FEET

465 000 FEET

(Joins sheet 57)

(Joins sheet 60)

(Joins inset A)

Westwood

Prospect Church

NEW KENT COUNTY

INSET A

70C 2 378 000 FEET (Joins lower left)

(Joins 63)

456 000 FEET

455 000 FEET

2 380 000 FEET

1000 AND 2000-FOOT GRID TICKS

INSET B

2 360 000 FEET (Joins sheet 63)

443 000 FEET

CHICKAHOMINY RIVER

NEW KENT COUNTY

HENRICO COUNTY

441 000 FEET

2 365 000 FEET

2000 AND 5000-FOOT GRID TICKS

460 000 FEET

2 395 000 FEET

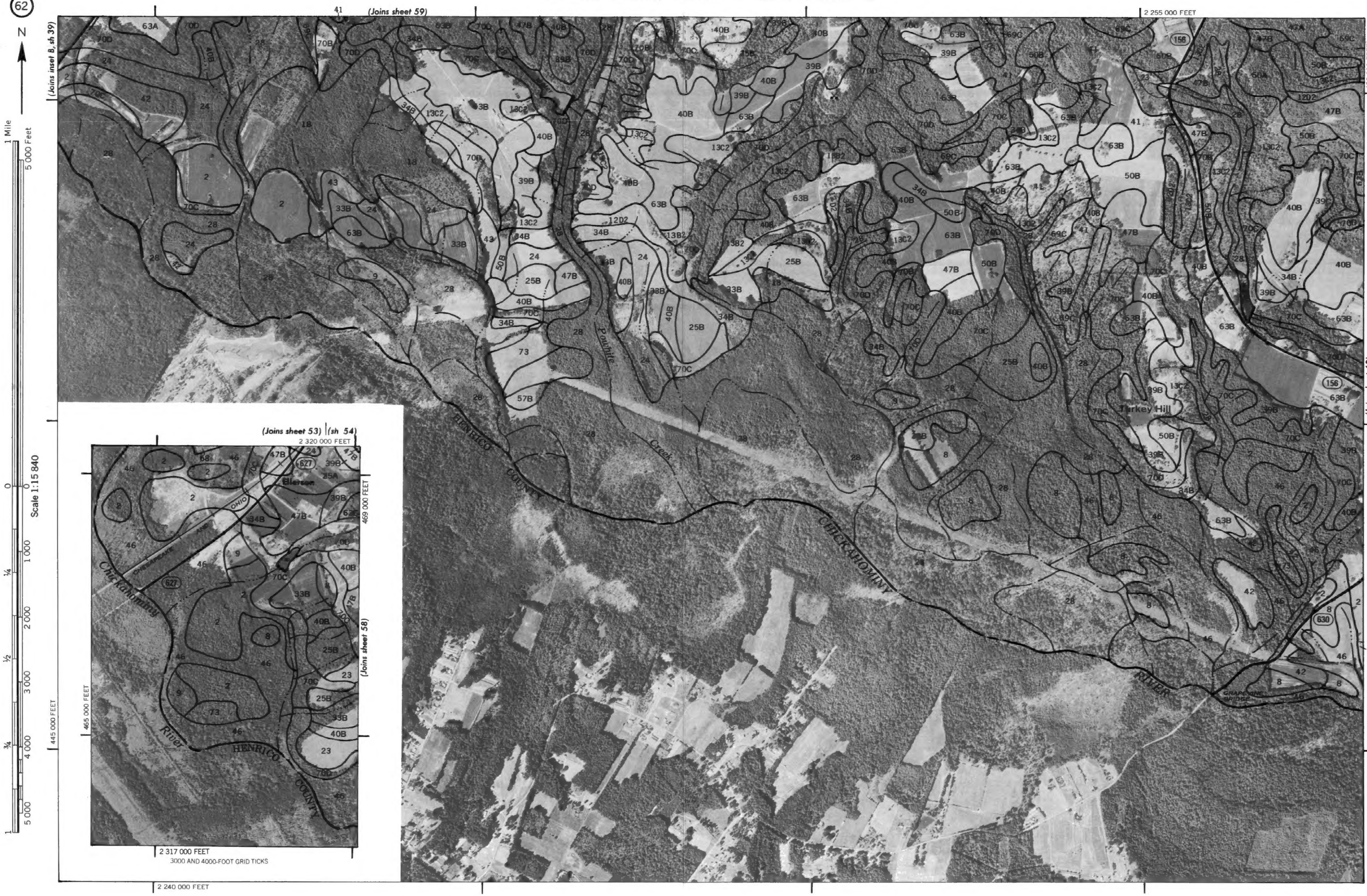
1 Mile

5 000 Feet

Scale 1:15 840

HANOVER COUNTY, VIRGINIA NO. 61

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

HANOVER COUNTY, VIRGINIA NO. 62

HANOVER COUNTY, VIRGINIA NO. 63

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.